OCT 7 1938

FOOD INDUSTRIES

OCTOBER 1938

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IN THIS ISSUE: Public Relations for Industry; Lockers for Frozen Foods

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FOOD INDUSTRIES

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Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 10, No. 10

Laurence V. Burton, Editor

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OCTOBER 1938

The Talk of the Industry

» A. & P. is "getting religion." At last, A. & P. is taking the public into its confidence. A. & P. is going to fight anti-chain store legislation by telling the public its story. A. & P. is going in for Public Relations in a big way.

Splendid. Highly commendable, even though tardy.

But, A. & P. has "engaged Carl Byoir and Associates to do this work." Which means public relations improvement by proxy, not by deeds. Also, the question at once arises, how about supplier relations? Mr. Byoir's biggest job ahead of him is right at 420 Lexington Ave., New York.

» THOUGH THE DIES COMMITTEE in Washington is still trying to force Madame Secretary Perkins to deport Mr. Harry Bridges to his native Australia, one surmises that this stirrer-upper of strife will remain at the old stand and continue to tie the West Coast into knots. A friend re-

turning from Australia reports that business men in that country say he always was a trouble maker and they sincerely hope Miss Perkins succeeds in keeping him in the United States.

» CONSUMERS RESEARCH, INC., has invited us to join up so that we may know the right razor blades, shoes, or automobile to buy—on a confidential basis, of course. Wish somebody would inform us, confidentially, which consumer movement we ought to join, for one never knows whether one should ally himself with the Consumers Research or the Consumers Union.

» NOW THAT HEARINGS on new standards of identity on manufactured or processed foods are apt to be announced at almost any time, it behooves cautious manufacturers to keep label inventories down to about a 120-day supply. The reason is that according to the new federal food law, standards shall become effective 90 days after their official promulgation. That plus the 30 days notice of the hearing makes 120 days. It would be most unfortunate to have a lot of labels rendered obsolete by a new food standard or definition.

» AT THE RISK of being tedious we want to repeat the warning elsewhere in September and October FOOD INDUSTRIES that all manufacturers must put in an appearance at hearings under the new food law where food standards are to be reviewed. If you don't show up at the right time you lose your rights to complain later.

» INDUSTRIAL LOANS to food manufacturers made by the Reconstruction Finance Corporation continue to be very small. A recent listing showed that the biggest was $25,000, with the bulk of the loans below $7,000. As a matter of fact, the food industries won't need many loans if prices are reasonably stable.

» REMARKS from the Borden Company about poor earnings during the summer indicate that curtailed ice cream sales were responsible This in turn was caused by excessive rainy days. In case you have not heard about it, all the Eastern states had an amazing amount of bad weather in mid-summer. Ice cream was not the only thing to suffer from unseasonable weather. The proprietor of a few roadside stands sobbed to us in July that about a ton of hot dogs spoiled in his hands. Reason: No Sales. Rain just about ruined him. Summer camps for youngsters were forced to send the kids home.

Pea production became scandalously large. So did milk and butter production. Wheat, hay, cabbage and many other farm crops grew to burdensome amounts.

Which prompts us to suggest to our readers to get out their January issues for 1937 and 1938 and reread in each "What Will the Weather Be?" Far be it from us to say we told you so, but it begins to look as if we ought to charge real money for long-range forecasting.

» CONTRARY to many carping critics of President Roosevelt, he is not intolerant about ALL opposition. As a matter of fact he feels very friendly to some critics of his agricultural policies. Recently he shocked Secretary of Agriculture Henry Wallace no little by this genial attitude. It seems that several gentlemen were conferring

with the President on the political situation in Kansas. They told him that probably the Democrats would elect their candidate for governor, but they were afraid that Clyde Reed, former Republican governor, would defeat Senator George McGill.

"That will be all right with me," said the President, cheerfully.

"Why, Mr. President," protested one of the callers, "Clyde Reed has criticized sharply nearly every policy the Administration has adopted about agriculture, while Senator McGill has voted for everything the Administration has wanted, in agriculture as well as everything else."

"Nevertheless," said the President, "Clyde Reed is an aggressive liberal."

The subject was changed at this point, for the callers happened to hold appointive offices and were not prepared to express their real views. But the word has gone all over the Department of Agriculture and all through Kansas circles in Washington. Incidentally it has reached certain other hundred per cent New Deal senators and representatives, who are wondering what one has to do to get real Administration support.

Just what is the American System?

"PRIVATE ENTERPRISE IN TRANSPORTATION cannot long survive if we continue to maintain 139 separate Class I railroads, over 500 short-line railroads, 62,000 trucking companies, 4,700 bus lines and 2,600 different water lines and 19 airlines; all engaged in destructive and costly competition with little or no coordination between them,—with duplicated facilities and services."

The foregoing paragraph is quoted from a handout "P.R.—21" (presumably Public Relations Release No. 21) from the Transportation Association of America, dated Aug. 23, 1938. Apparently it is directed to farm, business and financial groups in all cities of 5,000 population and over.

It is a complaint against competition, as anyone can see, yet it goes on to say that the association has a program "looking to the perpetuation of private enterprise in this major industry."

Just what is the American system, if it is not the competitive system? If business men continue to yell for relief from competition, there should be no complaint when relief comes via the route of bureaucratic control from Washington. Which is but a step removed from one of the isms (we quaintly suspect that it is socialism).

While admitting deep sympathy for the railroads in their present distress, we cannot admit that sloppy thinking, as exhibited here, is good public relations work—unless, by some remote chance, the association is actually plugging for government ownership of the major public services. And that, of course, would be socialism.

Vagaries of Transportation

NEW FACTORS, often unexpected, continue to arise to complicate the economy of the food industries and to perplex those whose daily task is to cope with the problems of distribution. Such problems are typified by the extreme variations of permissible gross weights of vehicles on highways in various states. To illustrate: If a truck shipment originates in Chicago, where the Illinois law permits 72,000 lb. gross weight, and heads for Tennessee, it will be 300 per cent too heavy to meet the 18,000 lb. stipulations of Kentucky or Tennessee highway regulations.

Rhode Island, which can be traversed by an auto in less than an hour, permits gross weights of 120,000 lb., whereas adjacent Connecticut permits only 40,000 lb., a third as much.

Kansas has adopted a port of entry system (now duplicated by most of the surrounding states) where "foreign" trucks must enter at any one of the 66 stipulated ports of entry, there to pass all manner of inspection of equipment and papers. The method is costly, vexatious and time-consuming

Hors d'Oeuvres

• Think of it! Fifty-seven millions of dollars have been spent to make the doughnut what it is. But then, bigger investments have ended up in the hole.

• *Flour containing the germ of the wheat berry is being milled by a new process* (FOOD INDUSTRIES, *September, page 515*). Time *referred to this as "germy flour." Accurate, perhaps, but not too appropriate. We hope bakers don't try to sell "germy bread."*

• Increasing flour mill capacity has made Czechoslovakia self-sufficient in respect to flour. That's one thing Czechoslovakia doesn't have to worry about.

• *Gooch Milling & Elevator Co., Lincoln, Neb., is packaging flour in bags of high quality percale that can be used in dresses. Now if some company would package cakes in hats, another put soft rolls in stockings and a third sell limburger cheese in shoes, milady would get free of charge all the clothes she would care to mention.*

• How ancient is the oldest container of soup in America? Give up? Seventy-seven years. It is a flask of veal broth sealed by Louis Pasteur himself and presented to an assistant, Dr. Ernest LaPlace. The present owner is the latter's son, Dr. Louis B. LaPlace, Philadelphia physician.

• *Fifty thousand years ago mastodons became mired in the bogs of Siberia and were frozen. Today, if reports from many reliable sources are to be believed, some of these animals remain in a good state of preservation. Natives have fed their flesh to dogs and scientists and travelers have tasted the meat. Did we hear something about a recent technic of preserving foods by freezing?*

• The Swiss top all peoples in milk consumption, drinking 232 quarts per capita per year. Americans are second with 153 quarts. Another 79 quarts and we'll be able to yodel.

• *Information about a dial thermometer of the type used in food plants has come to our desk, accompanied by a photograph. The picture shows the thermometer and alongside it, in a brief bathing suit, a most charming feminine chart—you know, set of curves. 'Tis all very lovely, but there is a flaw. The thermometer, on which the hand of the bathing beauty rests, reads 92 deg. F. It ought to be biologically accurate and read at least 99.*

• Down in Upson County, Georgia, they are taking the fuzz off peaches. The fruit passes over revolving rolls which keep it turning while a set of motor-driven brushes whiz over it and zip off the goopher feathers. Bet the machine won't remove frog hair.

• *From the Middle Ages to modern times more wars were fought over salt than any other commodity. Now there is ample salt for all, but if anyone has noticed a decline in the number of wars he has failed to report it. Apparently the means to the end has turned out to be the end itself. Get it? We don't either.*

• Lewisite, famous war gas, was invented by Dr. W. Lee Lewis, better known in the food industries as director of research for Institute of American Meat Packers. The trend in national affairs reminded us of this.

• *Twice—once in the last issue and again this month—we have warned you that it is important for food manufacturers to appear at hearings on food standards. If you don't appear and then in the future complain about the lousy standards that apply to your industry, we shall say, with the semblance of a sneer: "Ah, we told you so!"*

F.K.L.

—and it is changing the character of such commerce from interstate to intrastate. The U.S. Department of Agriculture believes that such vagaries as the foregoing are rather detrimental to farmers.

Despite the obvious opportunity that such an anomalous set of conditions creates, we have not yet seen that any of the railroads are advertising to capitalize on the situation and attract business. Sometimes it seems as if the railroads forget that they are still in business and must get business by businesslike methods.

Worthy of Your Attendance

A CONFERENCE on food preservation to be held at the University of Tennessee, Knoxville, Tenn., on Oct. 20 and 21, is one that should draw a large audience from a wide area. In particular, those who are interested in learning at first-hand of the development work on the theory of freezing and its correct application which is now under way at the university, will have an unusual opportunity.

Many men in the food industries were disappointed that they did not attend a similar conference at Pennsylvania State College in the spring. Their disappointment arose because they were not informed of this meeting in time. This time there is ample notice. In our judgment the Knoxville meeting will deserve the attendance of dairymen, meat packers, fruit and vegetable canners and freezers, fish freezers, locker freezer plant operators, and all others who are interested in low temperature preservation of food. The meeting is jointly sponsored by the University of Tennessee and the American Society of Refrigerating Engineers.

A Peach of a Time

CLING PEACH GROWERS were on the warpath during the summer in California because, owing to a huge canned peach carry over from last year, the canners' bid price for "green fruit" dropped from $40–$45 per ton in 1937 to a mere $6.50 in 1938. Some of the growers, as a result, have contracted with certain local canners to pack their peaches on a toll basis, and have made contractual arrangements whereby the growers can exert some influence on selling prices.

Something about the problems of selling a commodity in an over-loaded market will be learned from the experience. And maybe they may discover that public preference—a most fickle thing—is slowly going to other types of fruits and packs. In the meantime, the California Farm Bureau Federation demands that the U. S. Department of Justice shall investigate the Canning Industry Board of California, a closely knit organization which decided to curtail 1938 operations by one-third.

Don't Lose the Flavor

IN THEIR EFFORTS to improve the nutritive quality of manufactured foods, those who labor in this direction often unwittingly run the hazard of masking the true flavor of the traditional product. Often it is this true flavor that is referred to as the old-fashioned flavor, or the kind that mother used to whack up so well. Progress of nutritional science should be translated into commercial practice as rapidly as the facts warrant, but it will be a commercial error to lose that appetite-stimulating flavor to which man has been accustomed for centuries while worshiping at the altar of greater nutritive qualities. The trend of the times is toward improved flavor.

Food Consumption Constant

IT SEEMS TO BE pretty well established that the per capita consumption of food in the United States does not vary more than a per cent or two in good times or bad. This seems to be borne out by certain recent tonnage figures from corporate chain stores. Yet, though they show a constant volume on considerably lower prices, these figures must not be regarded as a complete substantiation of the principle. Per capita food consumption must include not only manufactured foods and green groceries and fruits, but also the foods produced and consumed on the farm.

This word of caution is given for some manufacturers, noting about a 15 per cent fluctuation in manufactured foods statistics, are questioning the validity of the principle of constant volume.

Laboratories Improve Selling Conditions

IN SPITE OF SO-CALLED PROGRESS, it is found that many industrial purchasers of food raw materials still buy on the price basis alone. This practice is found to exist even where the raw materials are ones that can and do vary considerably in their intrinsic worth.

It is so much surer, simpler and more accurate—to say nothing of easier—to have a laboratory determine the true merits of an offered product than to try to get tough about purchase prices in the absence of exact knowledge. And it is equally true that a concern that tries to chisel on prices, with no knowledge of true quality it is buying, must likewise be conducting its selling operations with equivalent blindness. For, if the concern had a laboratory, it would be using it properly in selling as well as buying.

Verily, he who chisels for the sake of chiseling, usually finds his own salesmen will receive the same sort of treatment. Think it over.

Food Science vs. Food Technology

FOR SOME MONTHS it has been apparent to FOOD INDUSTRIES that the distinction between science and technology is not widely understood. Whether we are rash in attempting to clarify the thinking of our friends on this subject, we leave to them to decide. If they choose to debate the matter, we shall be glad to set aside several pages in our December issue for that purpose.

The sentiment of men in the food industries about the formation of a permanent organization of food technologists is now being sounded. The purpose of such an organization would be to bring together bacteriologists, chemists, research workers, and technologists in the food industries. To which purpose, we feel should be added three more types of men: food engineers, operating men and horticulturists—perhaps others.

At the present, the term "technologist" occupies an indefinite place in the minds of many. To most scientific workers he is apparently a man of scientific training who should make his headquarters in the chemical laboratory. And pursuing this idea further, the thought seems to develop that a technological group should organize under the auspices of the American Chemical Society. With which we disagree, very vigorously: not that we are plugging for the creation of any more organizations, nor that we have anything against the American Chemical Society of which we have been a member for roughly thirty years. Our feeling is that there is a very definite need for a common meeting place for food plant operating men, food engineers, refrigerating engineers, food technologists, chemists, bacteriologists,

(*Turn to page 594*)

Drafting NEW FOOD STANDARDS *Is Soon To Begin*

An Editorial Staff Interpretation

STANDARDS OF IDENTITY and of quality of foods are to be formulated under the new Food and Drug law. At present there is only one official food standard. It is the result of Congressional action, taken years ago, which requires that butter contain not less than 80 per cent by weight of butterfat. Congressional action is not expected for setting standards of other commodities. The Secretary of Agriculture now has authority to establish standards.

OFFICIALS of the Food and Drug Administration who are charged by the Secretary with the enforcement of this law regard the fixing of standards as one of their most important present tasks. And it is a task that will continue indefinitely, for there are an indeterminately large number of commodities for which such standards are needed. No formal program has yet been adopted, but it is expected that the first commodities to be studied will be those for which informal standards have existed under the old law.

Procedure in the formulation of standards is vastly more important to the food industries than any present decision as to what commodities will be studied. Ultimately, most of the important commodities that are susceptible to this treatment will have attention. The plan of action is about as follows:

The technical staff of the Food and Drug Administration at Washington is charged with the continuing, primary responsibility for studying each food susceptible of standards action. These men will bring together all of the published information and the results of their researches so that the administrative officials may know at any time the latest available facts on each question. When each specialist thinks that he has enough data for the establishment of a standard, he will take up this question with the permanent secretary of the Food Standards Committee. (The constitution and authority of that committee is explained below).

The committee will then advise the chief of the Food and Drug Administration as to whether such a commodity should have immediate attention, and whether the proposals of the technical staff seem reasonable and adequate.

On the basis of the recommendation of the Food Standards Committee favoring the fixing of a standard, it will be the normal procedure for the chief, Mr. Walter G. Campbell, to recommend such action to the Secretary of Agriculture. In other words, the Food Standards Committee has the primary responsibility of advising on the important question as to whether the facts available are adequate to justify the formal procedure of fixing a standard. The chief is not required to accept the findings of this advisory committee; but it is quite unlikely that he will ever depart radically from them, because the composite judgment of six skilled specialists is likely to be very persuasive. It is this fact which makes for the great importance of the Food Standards Committee.

There is no provision in the law for the establishment of this committee. Congress did not think it was necessary to require it as a part of the machinery of fixing standards. But the officials of the Department recognized the necessity for making the broadest possible approach to so fundamental a question as a quality or identity standard. They, therefore, felt that outside judgment should be considered in each case before embarking on any individual standards program.

Under the old law there was such a committee which had informal status. It was made up of nine individuals, three each from the Food and Drug Administration, the Association of Official Agricultural Chemists, and the National Association of Food Officials. The same agencies will be represented on the new committee, but there will be only two representatives from each of the three agencies. The committee of six members will be, it is hoped, less cumbersome and expensive in action.

On Aug. 13, 1938, the following personnel of the Food Standards Committee was announced:

For the Association of Official Agricultural Chemists: C. D. Howard, Division of Chemistry and Sanitation, State Board of Health, Concord, New Hampshire; Guy G. Frary, State Chemist, Vermilion, South Dakota.

For the Association of Dairy, Food and Drug Officials of the United States: J. J. Taylor, State Chemist, Department of Agriculture, Tallahassee, Florida; Mrs. F. C. Dugan, Director, Bureau of Foods, Drugs and Hotels, State Board of Health, Louisville, Kentucky.

For the Food and Drug Administration: W. B. White, Chief, Food Division; W. S. Frisbie, Chief, Division of State Cooperation.

THEIR DUTIES will cover definitions and standards, both of identity and of quality, and also fill of containers.

Those individual members of the committee who are named from outside the Food and Drug Administration are appointed as professional consultants of the Department of Agriculture. They thus have a definite official position in the work, and are compensated for their services on a per diem basis, and their expenses are paid by the department. This new plan has seemed essential, because of the very great increase in the quantity of work which it is expected that this Food Standards Committee will have to do.

In order that this mass of work may have regular attention there will be a permanent secretary for the committee, one of the skilled and experi-

enced technical members of the Food and Drug Administration staff. He will have no other duties than to keep the committee membership informed on all subjects of interest, and to see to it that each subject on which the committee wishes to work is aggressively handled by every person who should be engaged in support of the standards program. The permanent secretary will also have legal advice regularly at his command from the Department of Agriculture.

ONCE the Food and Drug Administration has recommended that a standard be fixed by the Secretary of Agriculture the further procedure is definitely provided by law. The Secretary must give appropriate notice, at least 30 days before he intends to hold the required public hearing, that will set forth the proposal for the standard in general terms that all interested can understand. At the hearing, any interested person may be heard in person or by his representative. The record of this proceeding becomes the formal basis on which all subsequent review must be based. Attendance at such hearing and the submission of all pertinent evidence will, therefore, be an essential responsibility for every proponent or opponent of the proposed standard. *This is very important!*

As soon as practicable after the hearing, the Secretary must make public his action regarding the proposed standard. He is required by the law to base his findings and order only on substantial evidence of record at the hearing. And in his announcement he must set forth as a part of his order definite findings of fact on which his order is based. A new standard will take effect no sooner than 90 days after it is issued, unless the Secretary finds some emergency condition requiring earlier effective date. But there is no expectation that with respect to standards there will be the occurrence of any such emergency.

After the standard is so fixed and becomes effective, the provisions of the standard are just as compelling as if Congress had passed a law to the same effect. If there be controversy regarding the reasonableness of the standard, anyone adversely affected by such order may file a petition in the Circuit Court of Appeals where he resides or where his principal place of business is located, asking for judicial review of the Secretary's order. The court will then serve notice on the Secretary, and he must file in the court a complete transcript of the proceedings on which he based his order. The court then reviews, and confirms or sets aside in whole or in part, the Secretary's findings *on the basis of the record.* For this reason a food manufacturer must appear at the first hearings.

NEW EVIDENCE is not introduced in this court review unless the petitioner can show to the satisfaction of the court that such additional evidence both is material and that there were reasonable grounds for not having brought that evidence into the proceeding before the Secretary. If the Secretary, on the basis of such additional evidence submitted to the court, wishes to modify his findings, he may do so. Then the court review applies to the modified order of the Secretary.

An official standard once announced is not, however, unchangeable. The law clearly contemplates that at any time there may be need for a modification of a definition or standard. Such change may be arranged for on the Department of Agriculture's initiative by the same formal proceeding as is used for fixing an original standard. But it is required also that the Secretary shall reopen the case upon application of any interested industry, or substantial portion thereof, stating reasonable grounds for a request for a change. It is to be expected that standards once fixed under the very careful procedure required will stay unchanged for extended periods. Nevertheless, the Department of Agriculture clearly recognizes that changing conditions or changing business methods may require a change of standards. And it is expected that such modification will be made whenever there is real evidence from the industry of the importance of a change.

Adoption of a Federal standard establishes a legal limit on quality of goods which may move in interstate commerce. Such standard is not applicable with legal force to intrastate business. It is hoped, however, that a great many states will either pass laws, or adopt effective administrative regulations, making automatic the application of each Federal standard to the state business. Experience with the Federal butter standard indicates that this will be important, lest intrastate shyster practices develop to the embarrassment of responsible interstate distributors.

Standards for quality will, sooner or later, be fixed just as are the standards of identity. But it seems likely that this more complicated job will wait a while, until the identity standards program has advanced successfully.

THERE SEEMS TO BE no doubt but that a number of milk products, egg products, and prepared meats will have early attention. Commodities like macaroni and noodles, sauerkraut, flavoring extracts, mayonnaise, vinegar, baking powder, and tomato products are all on the list for early consideration. In fact, it is rather hard to name a division of the food industries in which the fixing of standards is not likely to be undertaken within the next few months or a year.

Officials at the Department of Agriculture hope that the industries will cooperate with them. Their effort is to make these standards into practical, workable definitions that will not handicap the honest progressive manufacturer. These officials seriously believe that the fixing of standards which have the force of law will do away with shyster practices, and thus be of benefit to the constructive enterprises among food manufacturers. On that basis they appeal for vigorous intelligent cooperation. They very frankly say also, "We want vigorous criticism of every one of our proposals that is not right or workable. A standard is good and useful only if it serves and does not handicap the industry to which it relates."

▶ ***Regulations under the new Food and Drug Law provide for the fixing of standards of identity and quality for all types of foods. Before each such standard is set, the Secretary of Agriculture is required to hold a public hearing. At that time, manufacturers and other interested persons will be heard. The record of this hearing becomes the only basis for any later review or modification of the standard. The food manufacturer must get his views concerning any standard into the original record. This is not a matter for the manufacturer's legal department alone. The technical and production departments are vitally concerned. Therefore, attendance and full participation in these hearings is important for***

ALL FOOD MANUFACTURERS

Engineering at "57th STREET"

World's largest milk plant incorporates dozens of ideas on economy and dependability in supply and utilization of water, steam, electricity and refrigeration

By H. McNABB
Chief Engineer, Sheffield Farms, Inc., New York, N. Y.

▶ ***Sheffield built its new two-and-one-half-million-dollar plant to cut costs (Food Industries, September, 1938, page 492). Vital to the success of this plant and the realization of its purpose is economy and dependability in the supply and utilization of water, steam, electricity and refrigeration. The means by which this is accomplished, as told in this article, involves ideas, equipment and methods that may be put to work by***

All Food Engineers and Executives

DEPENDABILITY IN PERFORMANCE plus economy in power consumption were prime factors in the selection of the equipment used in Sheffield's new 57th St. plant. Equally important were dependability in supply and economy in utilization of water, electricity, steam and refrigeration. Dependability must be assured in a plant handling so highly perishable a product as milk and in a plant which guarantees daily delivery to an area with two millions of population. As for economy, this had to be realized if the all-around savings from centralized operation in the new plant were to be obtained. And unless those savings are effected, the purpose of the new two-and-one-half-million-dollar plant is lost.

In planning the supply and utilization of water in the new plant, the engineers were faced with the necessity of using high-cost city water, because there are no wells in this section of Manhattan. This meant that steps had to be taken to assure a dependable supply and that every means had to be utilized to economize in the use of water. Dependability was attained by installing four connections between the plant and two separate city water mains. For further protection, all the incoming water lines are cross-connected.

To economize in the use of water various steps were taken. Of first importance is reuse of the water supplied to the milk cooler. This is circulated through a closed cycle, passing through the cooler and then back into the ice water tank for recooling. Then, as the pasteurization process is ending, there is a period of about one-half hour during which there is no cold milk to use for regenerative cooling. This means that city water must be used in the initial stage of cooling. Now instead of wasting this water, it is pumped into a reclaimed water tank on the roof to be supplied later to the hot water system. So not only is the water saved but the heat picked up from the milk is also saved.

Three additional measures contributing to water economy are the recirculation of the ammonia condenser water, the return of all steam condensate to the boilers, and the recirculation of water in the lines that supply the hose outlets. To permit recirculation through the condensers, the water is cooled in a spray cooling tower on the roof. This tower is equipped with three headers of 300, 600 and 900-gal. per minute capacities, so that it may be operated at several combinations of capacities in accordance with the refrigeration load. The only water wasted in this system is the small amount of 0.8 per cent lost by evaporation and drift.

Incidentally, there are reasons why a cooling tower was chosen rather than a spray pond. First, there is less loss of water from drift. Secondly the tower is more efficient because the water does not pick up as much heat from the sun as does that in a spray pond.

The economy that comes from recirculating the water supplied to the hot-water hose outlets in the building results from not wasting water while letting it run to get hot. Water at heater temperature is instantly available even at the most remote parts of the plant. The recirculation that makes this possible is effected through small pipes that connect the ends of the supply lines back to a small pump at the heater.

An electrolytic precipitator is employed to treat the condenser water after it leaves the spray tower and before it reenters the condensers. The precipitator, consisting of a large-diameter pipe into which is set an anode (the sides of the pipe are the cathode), removes scale-forming and corroding substances from the water. This material settles to the bottom of the precipitator and is flushed out periodically with a hose. Removal of foreign material from the water reduces scale formation on the condenser tubes and curtails the corrosion of these tubes. This saves in maintenance and repair costs.

Operation of an electrolytic precipitator in another Sheffield plant had proven practicable over a period of two years, which accounts for the installation of one in the new plant. Also, 57th St. is adjacent to a large power plant and it was expected that the water would pick up coal dust and sulphur fumes from the air in the spray tower and become acid. Besides, constant evaporation of water in the cooling tower tends to concentrate the solids in the water, including the scale-forming carbonates.

Another important economy connected with the use of water has to do with a saving in refrigeration rather than in the amount of water. An amount of refrigeration ranging from 50 to 90 tons, depending upon the load, is obtained more or less free of charge by passing city water coming into the plant through an ammonia precooler before using it in the bottle washers, cold-water hose outlets, wash basins and toilets. In passing through the precooler, the water rises in temperature about 10 deg.

Modern methods of heating water, permitting close temperature control and operating at higher efficiencies, are used in the plant. Previous practice was to control the temperature of the water used for milk pasteurizing by varying the amount of high pressure steam injected into the water at the milk heater. But this system had three objections. It was difficult to control the water temperature, the hot condensate was wasted and high-pressure steam was required. The use of a separate closed system for

Engine room at 57th St. Vertical and horizontal compressors are on left; ammonia condensers, left rear; ice water tank, right rear (tank is faced with brick); brine pumps and brine storage tank, right. Note piping on ceiling, an arrangement which removes it from show part of plant.

steam generating plant. This plant consists of two high pressure boilers, built to operate at pressures up to 250 lb. per square inch. But the highest pressure needed is 10 lb. to heat water and warm the building. So why put in high-pressure boilers? Here's the reason:

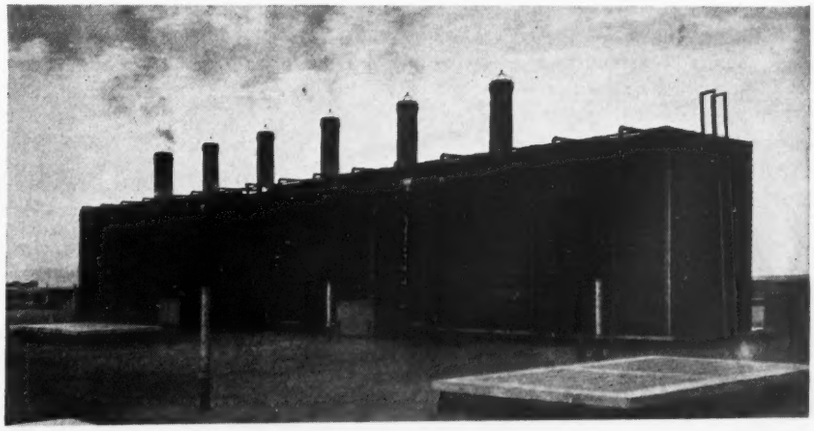
At present, Sheffield purchases all of the electric power needed for lighting and to drive ammonia compressors, pumps, conveyors, motor-generators and other equipment, a connected load of 2,120 hp. But at some future time it might become undesirable to continue this arrangement. For instance, the public utility might decide to charge higher rates for its current. This would increase the operating cost of Sheffield Farms, perhaps at an inopportune time. But what will happen now if electric rates get out of line? Sheffield can install a turbo-generator and produce its own electricity. Or it can install steam engines to drive its ammonia compressors, which comprise its major electric load. In the first case, the turbine could be bled for the steam necessary for heating water and the building. In the second, the engine exhaust might be utilized. Only a relatively small amount of exhaust steam would be needed, of course, because the heat load in a dairy is small compared to the power load.

By operating the boilers at low pressure, the necessity for a licensed engineer in constant attendance is eliminated. Fired as they are with oil and equipped with automatic controls, the boilers are operated through the occasional attendance of the engine room men.

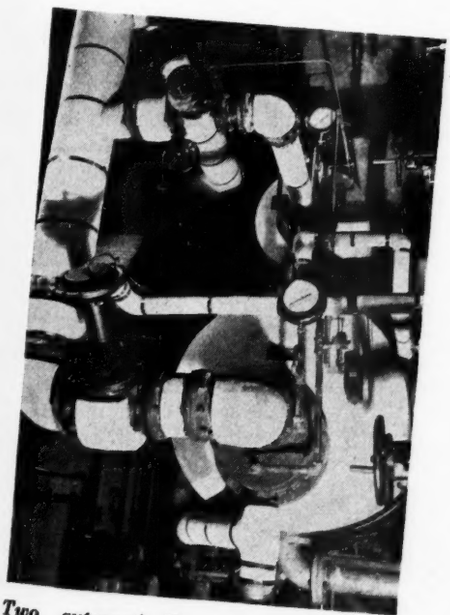
It might be more economical from

pasteurizing eliminates all three disadvantages and makes possible the use of low-pressure boilers.

Such a system is used at 57th St. for supplying hot water to be used in the milk pasteurizers. This system consists of two instantaneous heaters of the U-tube, four-pass type, having the capacity to heat 76 gal. of water per minute from 99.5 to 208.5 deg. F. These heaters are mounted above and supply water to 760-gal. storage tank from which water is drawn to supply the milk heaters. Control of water temperature is accomplished automatically by a thermostat in the heater discharge line. This thermostat controls an air-operated valve in the steam supply line to each of the milk heaters.



This spray tower on roof cools water used in ammonia condensers. Flexibility in capacity is afforded by headers of 300- 600- and 900-gal. per minute capacity. Smokestacks back of tower are those of Interboro Rapid Transit Co., proximity of which make advisable treatment of condenser water.



Two automatically controlled storage water heaters, one above the other. Small one serves office building; large one supplies water for general use.

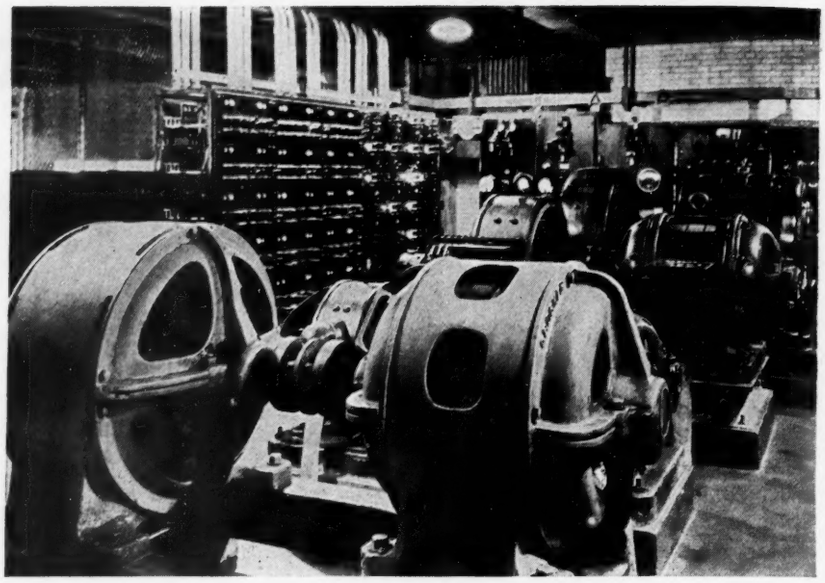
Hot water for cleaning the equipment and building is supplied by a storage heater with a capacity of 100-gal. a minute from 40 to 180 deg., and that for the office building is heated by a similar heater with a capacity of 16⅔ gal. per minute. These heaters are also automatically controlled, and they contain U-tube heating elements.

To assure dependability and cut maintenance costs, copper tubes and Everdur tube sheets and water boxes are used in the water heaters. The latter metal is a silicon bronze, which combines high strength, immunity from rust and ready weldability. The water pipes are of red brass, while wrought-iron pipes are used for condensate water and brine lines.

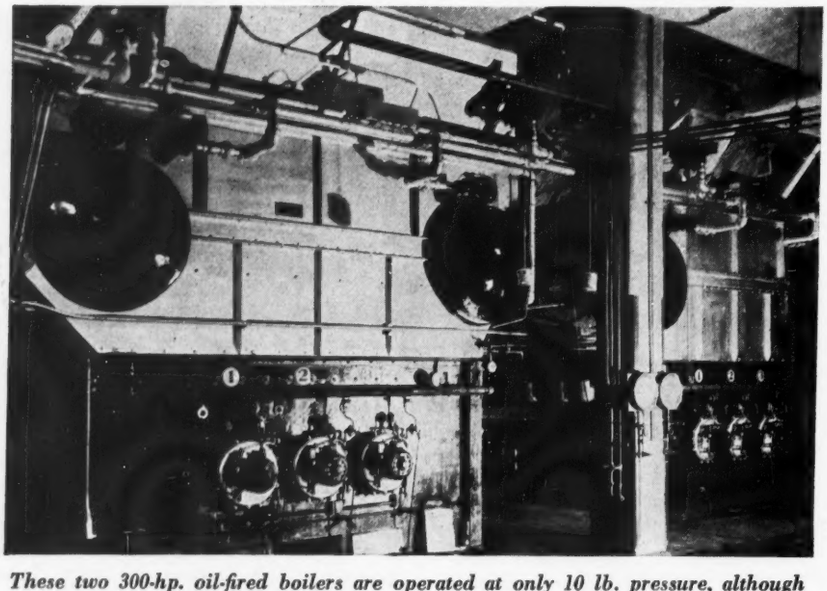
Unusual dependability plus long-range economy is incorporated in the

the standpoint of fuel cost alone to fire the boilers with coal rather than oil. But the additional labor required would cost almost as much as does the oil now used, to say nothing of the advantages of convenience, flexibility and cleanliness coming from the use of oil. The boiler room and boiler settings, however, are so designed that coal stokers or pulverizers can be installed. So in the future if it becomes advisable to operate the boilers at full capacity to generate electricity to drive ammonia compressors, the stokers or pulverizers may be put in at reasonable cost.

The boilers which carry the now light steam load are two 300-hp., marine-type units with welded drums. These can be operated economically at 200 per cent of rated capacity, giving a total boiler horsepower of 1,200. This boiler installation is large enough to generate all the electricity required should the occasion warrant, as the maximum load is only about 900 kw. But at present, the steam load in summer amounts to only about 150 hp. for one-half hour, 80 hp. for 7½ hours and 20 hp. for 16 hours. The heavy one-half hour load comes when pasteurizing starts and regeneration is not used in the milk heater. During this period cold milk must be heated by steam from about 40 deg. to 144 deg. The seven-and-one-half-hour load is the regular pasteurizing load, while the sixteen-hour load is that for heating water for general plant use. While the plant has not yet been operated in winter, it is estimated that the average steam load will be 450 hp. for one-half hour, 380-hp. for 7½ hours and 200 hp. for 16 hours.



Motor-generators of varying capacities permit flexibility and economy in charging electric truck batteries.



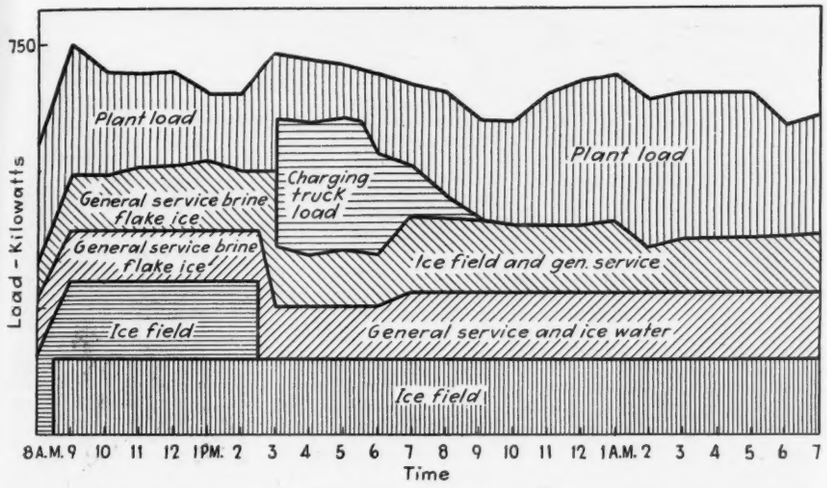
These two 300-hp. oil-fired boilers are operated at only 10 lb. pressure, although designed for 250 lb. They are an investment in future power economy, as Sheffield can install steam engines or a turbo-generator if electric rates get out of line.

Fuel to each of the boilers is supplied by three oil burners, each with a capacity of 90 to 450 lb. of oil an hour. And one or all of the burners may be operated, according to the steam demand, this providing considerable flexibility in steam generation. The oil is fed to these burners by one of two slow-speed rotary pumps, with the other pump for standby. And before going to the burners, the fuel is heated to 180 deg. in one of two steam heaters having a capacity of 200 per cent of the boiler rating. For starting the power plant and before steam is available, an electric heater is used to bring the oil up to the 180-deg. temperature. Self-operated automatic controls regulate the temperature in the oil heaters.

It is only because of automatic control that the present method of boiler operation is possible. Automatic safety devices shut down the oil burners in event of high steam pressure, high or low water in the boiler or accidental flame failure. And automatic controls maintain a high percentage of CO_2 in the flue gases over a wide range of loads—35 to 550 hp. These controls vary the furnace draft and the amount of fuel delivered to the burners.

In adition to these automatic controls, an alarm system has been installed on the engine room instrument panel to notify the engineer of trouble in the boiler room and in other "remote" sections of the plant. A bell rings and a red light flashes when any one of these conditions develops in the boiler room: the chimney is smoking in excess of a light haze, the boiler pressure becomes too high or too low, or an oil burner shuts down due to accidental flame failure or high or low water level. After an alarm has been given, the red light remains on until th trouble has been corrected. Then the bell rings again, stopping when the engineer sets the alarm in the "on" position.

Supplementing the automatic signaling devices is an instrument board in the boiler room. On this are mounted instruments which record


750
Load - Kilowatts
Plant load
General service brine flake ice
General service brine flake ice
Charging truck load
Plant load
Ice field and gen. service
Ice field
General service and ice water
Ice field
8A.M. 9 10 11 12 1PM. 2 3 4 5 6 7 8 9 10 11 12 1A.M. 2 3 4 5 6 7
Time

Composite picture of electric power load at 57th St., showing how individual loads are scheduled to give uniform total load. Last month the plant load factor was 80 per cent, which means low demand charges.

steam flow, feed-water flow and flue-gas temperature and indicate draft for each boiler. Also on this panel are two CO_2 recorders and a smoke indicator, or haze gage. The latter is operated by a photocell which measures the amount of light which will pass through the smoke, and hence determines the density of the smoke. The haze gage was installed as an economy measure, for New York City applies high penalties, up to $500 an offense, for excessive smoking in industrial boilers. The smoke gage warns the engineer when a smoking condition is developing at the 57th St. plant and saves these fines.

In designing the electric power system, dependability of the source of power was a salient feature. But in operating the system, economy through uniform load and a low demand charge is the principal endeavor.

Reliability of power supply is essential to a dairy plant if consumers are to receive unfailing daily delivery. The haze gage was installed as an 500-kva. transformers were put into operation in connection with two of the same capacity which previously furnished low-tension power and light to the old Sheffield plant. Each of these transformers is supplied by individual high-tension feeders direct from the power generating station. In addition to these precautions to assure a supply of power, low-tension connections have been made with the street.

It is even distribution of the electric load over the 24-hour operating period that effects the greatest economy in the utilization of electric power at the new 57th St. plant. In New York City there is a high peak demand charge, this starting at $2 a kilowatt per month and stepping downward as the demand increases to $1. So to level off the peaks in the demand curve, operations requiring large amounts of power are scheduled at different times. It is the practice, for instance, to charge the batteries of the electric trucks from noon until 6 o'clock in the evening, and during this time some of the ammonia compressors are shut down—some of the flake ice machines may be cut or the load on the ice field reduced. The electric load connected with pasteurizing and bottling operations comes on about 8 p.m. and continues until about 4 a.m. During this time there is no battery charging and only a few of the flake ice machines are operated. Then from 6 a.m. on, all of the flake ice machines are put into operation and the ice field is operated at capacity. The only load during this period is that due to refrigeration.

IT IS THE PRACTICE of the management to establish a new theoretical peak load each month, arriving at this by determining what the load ought to be. The plant is then operated according to a more or less definite schedule to meet this load. A recording demand meter shows how well the electric power consumption is leveled. So effectively was the load planned and manipulated during the past month that the load factor was 80 per cent. That is, the average load was four-fifths of the highest half-hour load for the month. And even at this high load factor the demand charge was about one-fifth the total electric power cost.

The heaviest of the electric loads is that for the engine room, where the ammonia compressors are located. In this room are 34 motors with a combined rating of 1,176 hp. Next heaviest of the loads is that of the motor-generators, three sets drawing 350 hp. The general building load amounts to 274 hp. for 56 motors; the miscellaneous refrigeration load, 50 hp. for 20 motors; and the boiler room load, 46 hp. The connected lighting load totals 200 kw.

In addition to the economy produced by balancing the electric load, high efficiency is effected by proper selection and operation of the motor-generator sets. The motor-generator is inefficient when operated under light load, as would occur as the batteries of the trucks become charged if only one motor-generator were used. But this inefficiency has been avoided by using three sets of varying capacities (a fourth set is in place but is not connected). This permits the operator to switch the generators or change the combination of them as the load varies, and the sets can be operated under practically full load for the entire battery-charging period. Aside from this, the motor-generators, comprising a fairly large load and being operated on off-peak hours, aid in leveling out the electric demand curve.

IN ADDITION to being the largest fluid milk plant in the world, 57th St. qualifies as one of the largest refrigeration plants. Designed by E. H. Paulson, one of Sheffields own engineers, now with Fairfield Western Maryland Dairy Co., the refrigeration plant has the capacity to produce more than one million pounds of ice and ice-equivalent per 24 hours. This enormous refrigeration load includes the manufacture of 100 tons of cake ice a day; cooling brine to a temperature of 10 deg. for the manufacture of 60 tons of flake ice a day; cooling water to 34 deg. at the rate of 320 tons of refrigeration for circulation through milk coolers, bottle washers and air-conditioning equipment and for supplying the ice field; and cooling brine to 10 deg. for circulation through the chill box unit coolers at a rate of 60 tons of refrigeration.

But aside from its great size and the fact that it incorporates all of the better known cooling media, the refrigeration plant is laid out for flexibility and operated for efficiency, not only in respect to refrigeration but to the total heat load of the plant.

Refrigeration is produced by two 10x10-in., vertical, twin-cylinder, single-acting, enclosed compressors each directly connected to a 125 hp. synchronous motor; two more compressors of this type connected to a 225-hp. synchronous motor; and two 9x14 in., two-cylinder, double-acting,

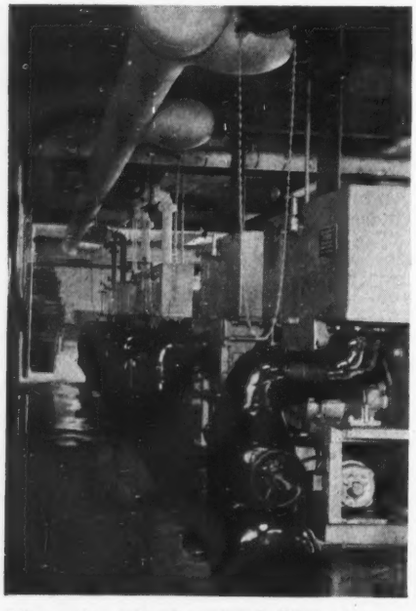
horizontal compressors each connected to a 200-hp. synchronous motor.

The two horizontal machines were taken from another plant and installed to handle the ice making load because they are suited to operating at low back pressure. This effected a saving in the investment. The vertical machines, which are new, are used on other than ice making work. Being vertical, they save floor space, and being equipped with clearance pockets for capacity control, they provide flexibility in meeting a varying refrigeration load. With the aid of the clearance pockets, which increase the amount of space above the piston in the compressor cylinder, the capacity of a compressor may be varied by as much as 40 per cent without much loss in efficiency.

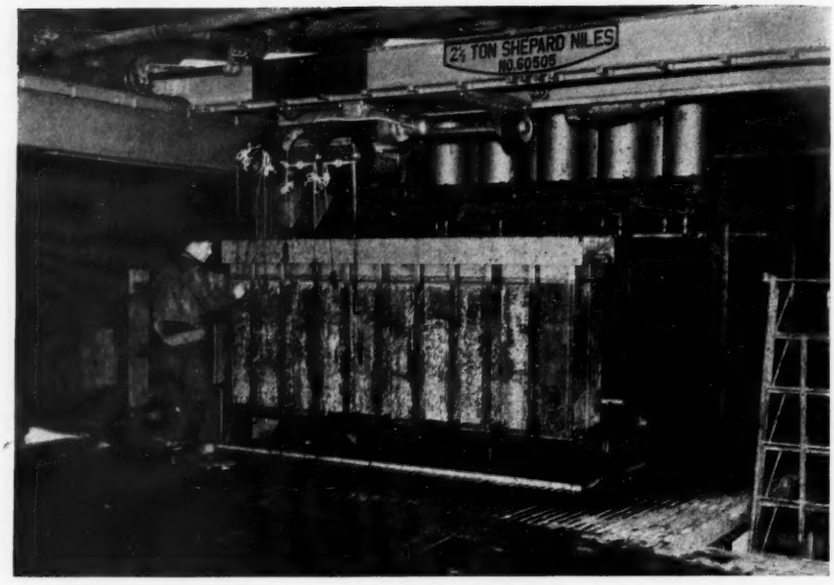
The synchronous motors are of the engine type, the rotors having sufficient weight to act as flywheels for the compressors. These motors and compressors operate at only 277 r.p.m., a speed low enough to insure dependability and increase length of service. Direct connection of the motors and compressors saves floor space and eliminates belt drives.

For sake of dependability, the synchronous motors driving the compressors are excited with one of two motor-generator sets, one of these being in reserve in case the other fails.

After being compressed and condensed, the ammonia is expanded in three multipass brine coolers, in the submerged shell-and-tube coolers in the ice field and in a "vertiflow" cooler in the ice water tank. The cold brine, stored in two closed tanks, is used to refrigerate the bottled-milk chill boxes on the first floor, and also the cake ice and flake ice storage rooms, and to freeze the ice in the flake ice machines. The ice water is supplied to the milk cooler, to the air conditioning system and to the ice field for freezing.



View along head end of flake ice machines, showing brine lines and controls.



Ten 300-lb. cans of cake ice are handled simultaneously by one man operating a traveling hoist. Battery of tanks back of hoist supplies measured quantity of water to ice cans.

SEVERAL ADVANTAGES are incorporated in this refrigeration system. First, the precooling of the water used in the ice field not only increases the capacity of the field by about 15 per cent, but it makes for higher refrigeration efficiency due to more efficient cooling. Secondly, the circulation of the 34-deg. ice water through the milk cooler, instead of brine at a lower temperature, saves in two ways. It permits operation of part of the ammonia compressors at the high back pressure of 40 lb. instead of 20 lb., with a power saving of 25 to 30 per cent. Then it avoids corrosion of brine piping and of the milk cooling tubes, curtailing maintenance and repair costs.

The ice water tank in which the water is cooled to 34 deg. is designed for high efficiency. The passage of the ammonia through the "vertiflow" coil in the water cooler is such that the coil is filled with liquid ammonia, the gas passing upward out of the coil. In an ordinary horizontal-tube cooler, about half of the tubes are filled with liquid ammonia and half with gas, which is not so efficient. The vertiflow coil, in addition to being efficient, is safer than the shell-and-tube cooler because there is no danger of water freezing inside the cooler and bursting the tubes.

The ice water tank is divided by a baffle, and agitators circulate the water on the "raceway" principle, causing it to flow over the cooling coils, around the baffle, along the other side of the tank, then around the baffle and over the coils again. This gives rapid cooling and a uniform water temperature. The tank measures 28 ft. x 20 ft. x 5 ft. 9 in. The coil has 5,400 sq. ft. of cooling surface.

Using the "vertiflow" coils to produce ice water and the ice water to cool the milk is practically the same as using direct-expansion of ammonia for cooling the milk, in that the ice water is not stored but circulated directly through the cooler. To control the milk cooler temperature, it is only necessary to regulate the temperature of the ice water at 34 deg., which is done by putting compressors on the line, or taking them off, as the cooling load varies.

Ammonia can not be used in the pasteurizing department, because New York City regulations prevent its use on the first floor or above. At 57th St., all the ammonia is in the basement, the only really safe place for it. Where ice water is not used to supply refrigeration on the upper floors, calcium chloride brine is employed.

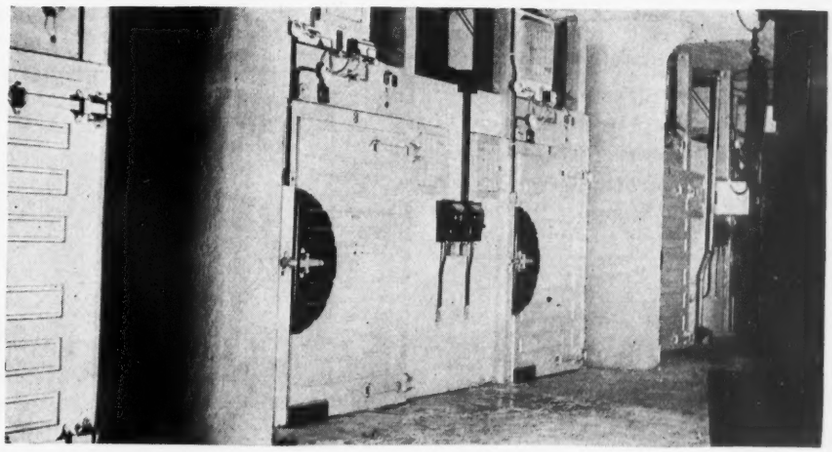
Contributing also to economy in the plant is the huge ice field, with its 100-ton capacity. Measuring 120 x 22.5 ft., this field contains 1,040 ice cans of 300-lb. capacity. The field is divided into two sections by a cross-

(Turn to page 591)

How AIR CONDITIONING Is Used

In Ripening and Storing Bananas

Temperature, humidity and ventilation requirements must be adapted to desired length of ripening time and period of storage.



Exterior of banana ripening and storing rooms of Alex Kontos Fruit Company, Inc., in Birmingham, Alabama.

By GEORGE H. WATSON
Birmingham, Alabama

SIX AIR-CONDITIONED ROOMS for use in ripening and storing bananas were recently installed by Alex Kontos Fruit Co., Inc., at Birmingham, Alabama. This improvement is in line with the experience of other fruit jobbers, and also with the results of research carried out by Fruit Despatch Co., Minneapolis-Honeywell Regulator Co., and other interested concerns.

These experiences and tests have shown that in air conditioning lies the solution of many of the problems that arise in curing and storing bananas. Temperature and humidity requirements have been studied and those necessary for placing the fruit on the market in the best possible condition have been determined.

The Kontos banana rooms were designed with these requirements in mind. Each room holds 1½ carloads of the fruit. Insulation of the rooms consists of two layers of 1½ in. cork board. There are doors at each end of each room, and these are of double, insulated construction.

Refrigeration is of the direct expansion type. It is supplied by two 5.6 ton Frick compressors and an 11.2 ton Niagara condenser.

Air conditioning can be carried out by unit conditioners in each banana room or by a unit installed outside the rooms, which are supplied by ducts. This latter method is used in the Kontos installation, with ducts insulated by 2 in. of cork. Each of the rooms is conditioned by a Niagara No. 212 unit conditioner, connected to the room by short ducts.

It has been found by the Kontos Co. that this air-conditioning installation enables it to hasten the ripening of fruit, or to hold it back, as market conditions dictate. Also, ripe fruit can be sold direct from the railroad car and green fruit removed to the storage rooms, thus saving demurrage charges.

IN GENERAL, the problem of treating bananas is one of heating or cooling, ventilating, and humidity control, during the time necessary to bring green fruit to the ripe condition, and then during storage until the fruit is sold. In this operation, both return and fresh air are circulated, the dampers being controlled manually in accordance with the operating cycle.

When fast ripening is desired, the fruit is first warmed to 70 or 72 deg. F. (or until the temperature of the pulp reaches about 70 deg. F.). In warming, the temperature is raised at the rate of 2 to 3 deg. per hour. The humidity is maintained at 90 to 95 per cent. After 24 hours, the temperature is reduced to about 68 deg. F. and held until the bananas color. It is then reduced to 66 deg. F. and held there. Ventilation is not used during the first part of this fast-ripening process, the air being continuously recirculated. Some ventilation is used after the fruit shows signs of coloring through, the amount being limited to 3 or 4 changes of air per hour. This freshens the air and reduces the humidity. Ethylene oxide is used to hasten the ripening of the fruit when it is slow or uneven in coloring. Heat is supplied from electric strip heaters. This process requires 3 to 4 days.

For ripening at medium speed, 5 to 7 days are required. If the fruit is cool it is warmed to 64 deg. F. If it is above that temperature, it is cooled down to it at the rate of one degree per hour. The temperature is then held at this point, with humidity and ventilation regulated as in fast ripening. Application of ethylene oxide is seldom required in medium speed ripening.

For slow ripening, an average time of 9 to 10 days is needed. In this case, the fruit is gradually brought to a temperature of 60 to 62 deg. F. and then held there. Under no circumstances should a higher temperature be used, even for a few hours. Temperatures below 62 deg. F. are not advisable for very thin fruit. Ventilation should be used, consisting of 3 or 4 air changes per hour. The humidity requirement is the same as for fast ripening. High humidity tends to slow ripening. The use of ethylene oxide is not necessary in slow ripening.

Storage of ripe bananas is carried out at temperatures varying from 56 to 60 deg. F. with 75 to 85 per cent humidity. Three or four air changes per hour are generally used, except when a greater or lesser amount of ventilation is needed to regulate temperature or humidity.

New Products From

▶ ***Conversion of waste material into profit is something that all food industries would like to be able to do. And while all may not be able to duplicate the accomplishments of the citrus fruit industry, what that industry has done and how it did it are of inspirational and practical value to***

Every Food Manufacturer and Engineer

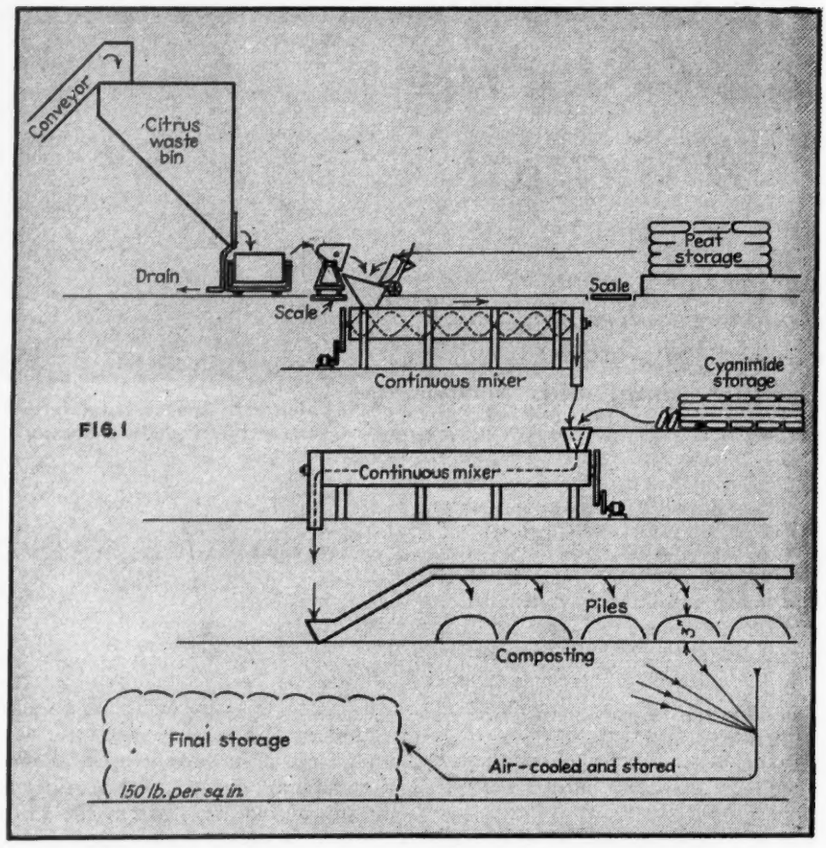


Fig. 1—Flow diagram of process for making fertilizer from citrus waste. For ease of presentation only, gravity feed is shown, but this would not adapt itself to the customary construction of citrus plants.

DISPOSAL OF FALLEN FRUIT became quite a problem in the Florida citrus industry during the fruit-fly epidemic a few years ago. And two new industries were created by the citrus growers in meeting this contingency. Those industries are the manufacture of nitrogenous fertilizer and the preparation of stock feed from citrus waste.

The development of these new industries involved more than a bright idea about what to do with a supply of unwanted material. It meant in both instances the development of new processes and the application of food engineering. Particularly difficult was the dehydration problem which had to be solved.

The process of making fertilizer was developed because it required little equipment and afforded a quick way of disposing of a large amount of citrus waste. The first step, in fact, was simply to reduce "drops," culls and citrus cannery refuse to pulp, this pulp being hauled immediately to the citrus groves. Spread over the ground in a thin layer, the pulped mass was found to have sufficient fertilizing value to warrant further development.

Research on this problem was carried out through the facilities of American Cyanamid Corp. and a process perfected which has become the accepted practice. In this process the refuse is ground in a hammer mill equipped with a screen having ¾-in. perforations. Then the ground product is mixed with peat and cyanamide in the ratio of 2,000 lb. of refuse to 400 lb. of peat and 400 lb. of cyanamide, the peat being added first and the cyanamide next. The purpose of the peat is to absorb moisture and reduce losses of nitrogen through solution and drainage.

Mixing of the three materials is done mechanically, preference being given to spiral types of continuous mixers. Concrete mixers can be used for batch operation, but they have the objectionable tendency of forming the material into small balls.

From the mixers, the material is conveyed to piles about three feet deep, where it is allowed to compost. Considerable heat is generated in this process, and sometimes holes are punched through the piles with a shovel handle to facilitate its dissipation. After one week, the composted material is cooled and then stored in large piles.

The yield of fertilizer obtained from citrus waste varies considerably. Assuming the waste to be well drained, the yield from it should be from 1 to 1½ tons of finished fertilizer per ton of refuse processed. As can be seen from the flow diagram (Fig. 1), the power requirements of the process are very modest, with the exception of the hammer mill. This mill requires 25 hp. in the average plant.

Analysis of the finished product shows about 4 per cent ammonia. Its moisture content is sufficiently low—45 to 55 per cent—so that the material feels dry to the hand. The principal value of the fertilizer derives from its humus-forming material and its available nitrogen. But it also acts as a soil conditioner, making the soil more retentive of moisture and more porous to air.

Development of the second by-product, cattle feed, was slower in the initial stages, but the commercial possibilities of the product are now generally recognized and are exploited on a large scale by citrus exchanges, canneries and fruit-packing houses in California, Florida and Texas.

The general method of processing the feed in Florida and Texas involves

WASTE

Citrus fruit industry develops processes for fertilizer and feed. Solves difficult drying problem.

By FRANCIS ROSSEAU
Consultant on Food Dehydration
Lyme, Conn.

first the disintegration of the waste material, as in the preparation of fertilizer, then the removal of excess moisture. The Louisville Drying Machine Co. has developed a lime-treatment process which greatly facilitates the dewatering operation by precipitating the pectinous material. The increased reduction in moisture content of the pressed material so treated makes possible substantial savings in the drying operation which follows. The chemical processing is made continuous and takes place in steam-jacketed screw conveyors feeding the treated mass to a continuous Louisville press.

This process of removing mechanically the moisture from citrus material is very difficult, especially from the peeling. The pores of the material seem to become sealed with increasing pressure with the result that the treated mass packs into water-tight layers. For this reason, the pressed cake seldom contains less than 75 per cent of moisture if the pectinous material has not been first precipitated.

Following mechanical dewatering is drying, the final step in the process. This, too, represents quite a problem. The mass has a tendency to stick together; there are fine particles of pulp and fiber which dry faster than the coarser material and consequently are easily scorched; and it is necessary to maintain low drying temperatures. Low temperature is necessary if the vitamins and food value of the material are to be preserved.

The dehydrating process is carried out in continuous dryers, this equipment being used for economy and to make possible the handling of a large tonnage of waste. Two general types of dryers are employed, the direct-fired rotary dryer and the steam-tube rotary dryer. In the former the products of combustion are mixed directly with the drying air, the mixture coming in contact with the material being processed. In the steam-tube dryer, the drying air and the material in process both are heated by steam tubes within the shell of the dryer.

The latter dryer has many advantages over the other for processing citrus waste. With it there is not the necessity of obtaining complete combustion to eliminate impurities from the drying air. Moreover, this unit permits drying at lower temperatures because it effects rapid evaporation. The temperature of the material is kept anywhere from 50 to 200 deg. F. lower than that of the incoming steam in the heater tubes by this quick vaporization of the moisture. Nor are those the only advantages. Since the air flow in the steam dryer is just that necessary to carry off the evaporated moisture, finer particles can be dried without being entrained in the air current. This reduced air circulation also permits lower stack temperatures and higher operating efficiencies.

Higher fiber content and greater water-absorbing qualities for steam-dried citrus feed are reported by Louisville Drying Machine Co. The material so dried will absorb five times its own weight in water in one minute, considerably more than will citrus feed dried in another manner. If the feed be exposed to water for twelve hours, the absorption increases to seven times the original dry weight.

The steam-tube dryer is one of the most economical to operate because of the effective distribution of heat through convection, radiation and conduction. A thermal efficiency test was made by the author on a Louisville rotary steam-tube unit operating on grapefruit peeling. In this test the

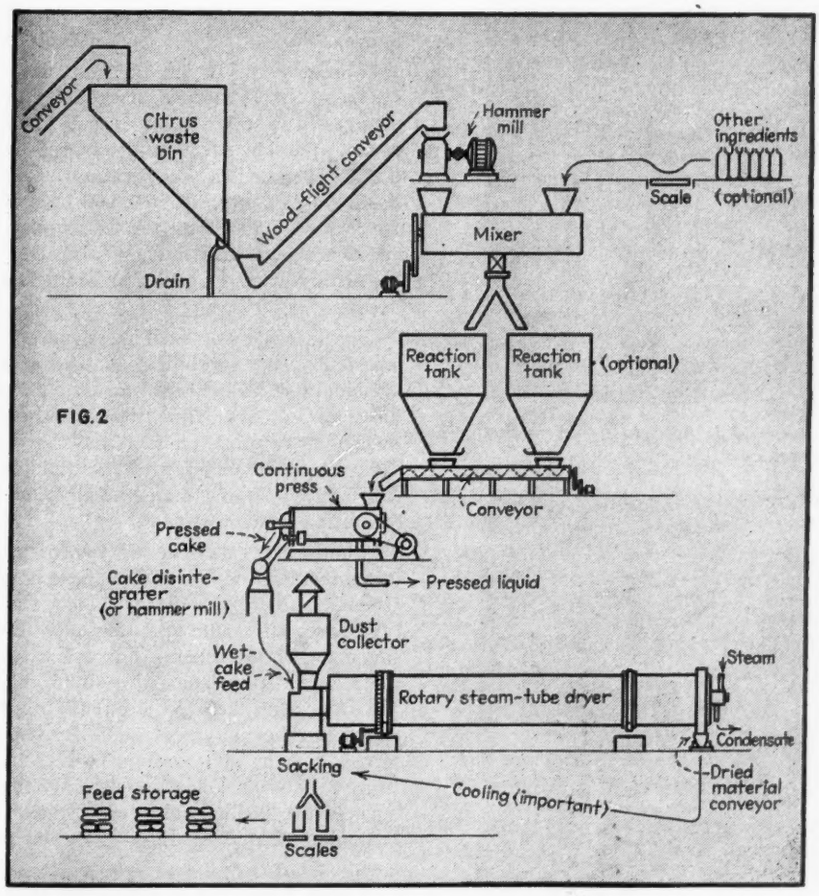
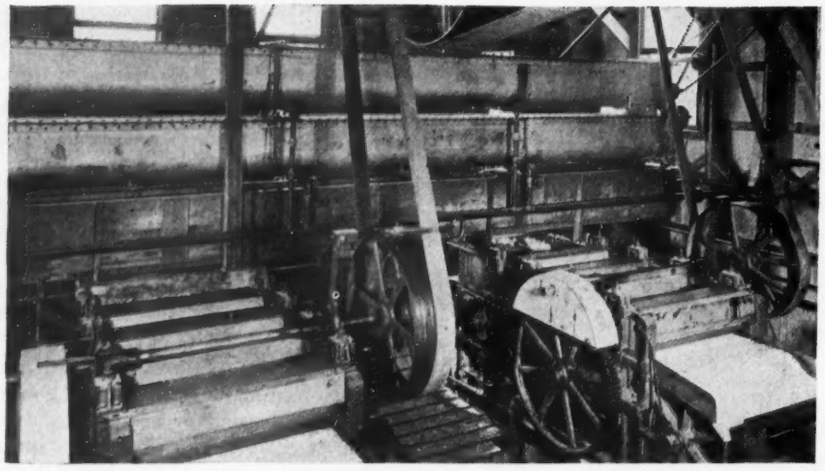
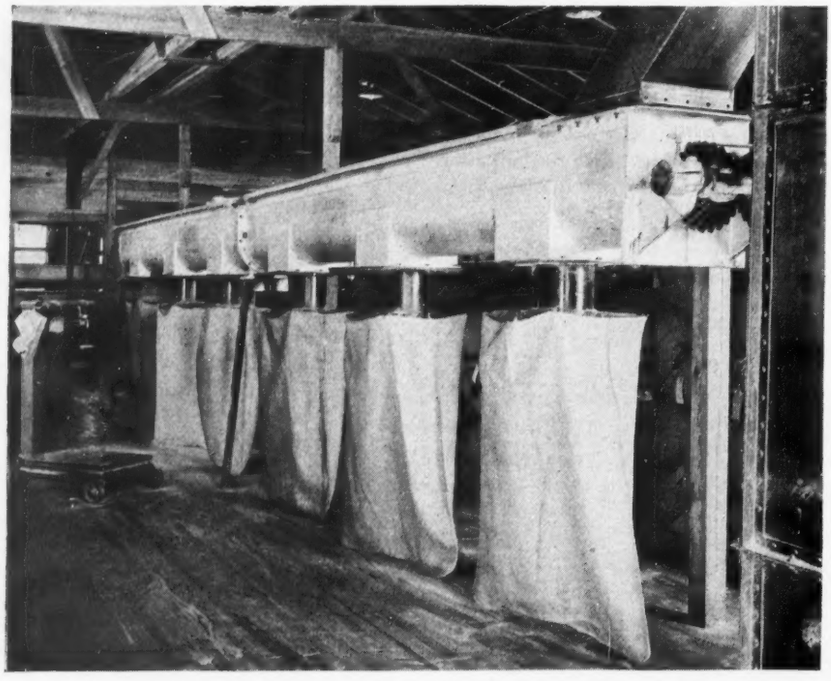


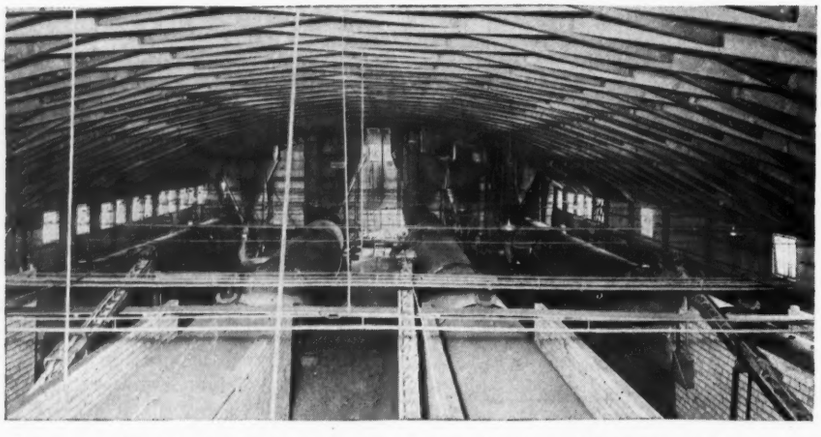
Fig. 2—Flow diagram of process for manufacturing cattle feed from citrus waste. Gravity flow is shown for ease of presentation only.



Two Louisville continuous presses with discharge end in foreground. Above, in background, are three horizontal conveyors; the upper two are steam jacketed for warming the waste before pressing.



View of floor directly above the dryer. Dried material is brought up in bucket elevator at right and discharged into a bagging conveyor.



Battery of four large direct-fired rotary dryers (8 ft. in diameter) which remove moisture from ground citrus hulls at plant of Rio Grande Valley Citrus Exchange, Weslaco, Tex. Furnaces supplying heat are in foreground.

efficiency was 85 per cent. On that basis, 0.69 lb. of moisture was evaporated per pound of steam consumed. Assuming that the moisture content of the dewatered citrus waste that is to be dried is 70 per cent, then for each ton of dried material produced, 4,667 lb. of moisture would be evaporated by the dryer. With the fresh waste at 70 deg. F., 5,260,000 B.t.u. would be required for drying 1 ton on the basis of 100 per cent thermal efficiency. A dryer with a thermal efficiency of 85 per cent would require 6,200,000 B.t.u.

Additional economy in steam drying comes from the utilization of live steam for prime movers in the plant and exhaust steam for drying. The thermal efficiency of such an installation, as reported by a leading manufacturer of rotary dryers, was 60 per cent for the boiler, dryer and engine combined. This corresponds to the thermal efficiencies of direct-fired dryers when they are operating at normal load. In actual practice, however, the tendency when using the direct-fired dryer is to overload it for the purpose of increasing the output. As a result, the operating efficiency drops enormously and very often is nearer 40 per cent than the reported figure.

Whatever the drying process used, the new citrus cattle-feed industry is progressing at a rapid rate. Only recently a large citrus exchange in Texas installed a dehydrating plant having a capacity of about 900 tons of fresh peel and citrus waste per day. Incidentally, citrus meal is also finding an additional market as a chicken feed.

The citrus cattle feed is an acceptable substitute for beet pulp, and at a considerable reduction in price. It can be fed in large quantities without injurious results. In fact, the coat of hair on cattle fed with it is thought by many to show exceptionally good condition and glossiness.

There are other citrus byproducts than fertilizer and feed, but these have been commercialized for some time and are well known. Perhaps the most important other product is citric acid, made from lemons. A byproduct of this manufacture is citrus pectin powder, the jellying agent extracted from lemon and orange peels. It might be mentioned in passing that grapefruit peeling also constitutes a valuable source of high-grade citrus pectin.

Other byproducts of the citrus industry include essential oils, extracted from lemon, orange and grapefruit peelings; marmalade stock; and wines.

Poultry Packers Put QUALITY *Under Control*

Packaged ready-to-cook birds processed to meet high standards

Part II

By
GEORGE F. STEWART
and
HARRY E. DREWS
Omaha Cold Storage Co., Omaha, Neb.

Specially selected birds are cooled to 32 deg. F. before going to drawing room for singeing and evisceration.

IN TAKING ITS PLACE among packaged ready-to-cook foods, dressed poultry has come under a critical consumer eye. It is exposed to a more exacting yardstick of quality than when marketed as a bulk commodity. As an identifiable food, it must stand inspection. In market appearance as well as in satisfaction to the palate of the consumer, it must stand on its own virtues to become a repeat-sale item. Being a newcomer (FOOD INDUSTRIES, June, 1937, page 384), its goodness in flavor and eating qualities and its convenience in handling and preparation for the table are its stock in trade.

Even though slaughtered and handled according to the best practice as outlined in (FOOD INDUSTRIES, September, 1938, page 491), bulk dressed poultry reaches the market largely in a chilled, undrawn state with heads and feet on, packed twelve birds in a box. In that state it is inconvenient for handling in retail stores, lacks eye appeal for impulse buying and is in danger of losing its place in the food budget of critical consumers.

In stepping forward into the ranks of packaged foods, ready-to-cook poultry has become a carefully graded product. It carries either government grade or a brand grade. It is eviscerated—fully drawn with head and feet removed—and is sharp frozen to preserve to the consumer the highest state of eating quality for each bird. Finally, it is individually packaged in a protective and appearance-aiding wrapper.

To promote consumer goodwill through brand identification, poultry packers, like other producers of packaged foods, have become highly quality-control conscious. Also, because of the competitive relation between poultry and meats of medium to low price, control over production costs plays its part in the packing of ready-to-cook poultry.

Production-cost control is largely dependent upon the efficiency with which the various unit operations are carried out. The operations that apply particularly to ready-to cook poultry are (1) grading to establish standards of quality based on either government or private specifications; (2) pinning and singeing; (3) evisceration; (4) wrapping and packaging; (5) freezing.

In the process of becoming ready-to-cook poultry, dressed poultry is cooled to about 32 deg. F. prior to drawing. This step makes for easier handling and prompt freezing after drawing to check bacterial growth. In the cooled state, the birds hang from portable racks for inspection under good lighting by trained graders. Birds selected for drawing meet standard specifications in respect to freedom from pin feathers, heavy fleshing, amount and

▶ ***Several unit operations common to many food plants are discussed in this article. Among these are inspection, washing, packaging, materials handling and freezing. The information given will be helpful to***
All Food Engineers

distribution of fat and conformation. Hanging on an overhead conveyor, the selected birds go into the drawing room where the remaining pin feathers are manually removed and hairs are singed off by a gas flame.

Evisceration is carried out upon two stainless steel conveyor tables with trays that are steam-sterilized each trip around the circuit. This operation involves making an incision in the posterior abdominal wall of the bird and drawing out the viscera as the bird lies in its individual pan. Then each bird passes before the government inspector, who examines it and the attached viscera for evidence of disease and unwholesomeness. Unfit birds are condemned and destroyed.

After removal of heads and feet on a stainless steel receiver, the birds are transferred to the next eviscerating table. A skilled workman slits the neck skin and removes the neck from the bird before it passes to the main eviscerating table. This table has individual stalls for the eviscerating operation as well as a pan conveyor system similar to the inspection table. The viscera are removed carefully by girls working on individual stainless steel trays placed at the side of the conveyor and upon which a stream of running water flows.

After government inspection, the opened birds are fully eviscerated by trained girls in clean uniforms working on water-washed, stainless steel trays alongside a stainless steel, steam-sterilized pan conveyor.

DURING the eviscerating operation giblets are carefully removed and kept separate. Rupturing of the intestines and gall bladder is avoided to prevent bacterial and bile contamination of the carcass. The importance of this precaution is best understood when it is realized that at this point the bird is most vulnerable to bacterial infection and contamination most likely to deteriorate its good eating qualities. Early work by Dr. Mary Pennington showed that in undrawn birds during the first few days after chilling only a few hundreds of bacteria can penetrate the intestinal walls to contaminate the surrounding flesh, even though the bacterial content of the intestines is in the millions.

After evisceration the birds are returned to the conveyor and moved along to a washing tank where high pressure water sprays clean out every trace of undesirable parts. Surplus moisture is removed by draining, and the cleaned, parchment-wrapped giblets are stuffed into the body cavity preparatory to shaping and wrapping the bird for packaging.

Shaping, or molding, consists of tying the legs to the tail, locking the wing tips, shaping the neck and wrapping the bird in printed transparent cellulose. This is an operation requiring skill if the finished bird is to have the best market appearance. If the bird or wrapping material is too dry, the skin of the bird will darken during freezing and shipment, and the wrapper will be loose and sloppy in appearance. By wrapping the birds in a slightly moist condition, the transparent-cellulose sheet can be stretched sufficiently to make a tight, attractive wrap. And this also reduces the tendency of the bird to "freezer burn." Wrapping is still a manual operation as machines have not yet been developed to do the job satisfactorily.

After wrapping, each bird is stamped with its net weight, is graded accordingly and is packed into a telescoped, waxed, fiber box for freezing. Freezing may be done by any one of several well known methods. However, the open, sharp freezing (—5 to —30 deg. F., with or without fans) and the contact (between refrigerated surfaces under pressure) (processes are the most commonly used. Below-zero temperatures for rapid freezing are regarded as a requirement for producing bright, fresh-appearing poultry. Rapid freezing gives a lighter appearance to the final product than does slow freezing. When the birds are retailed in frozen condition, this appearance factor is of importance because of the eye appeal.

When freezing is done by a direct-contact method or by air blasts, precaution must be taken to prevent dehydration or freezer burn. One of these precautions is the use of moistureproof material for wrapping before freezing. On the other hand, where conventional methods of freezing are used (closed boxes and no circulation) a lightly constructed box with at least one surface heavily waxed is generally sufficient. The waxed, double-walled, telescoped box has served admirably for freezing and marketing purposes.

Use of a moistureproof wrapper is imperative when the poultry is to be retailed from low-temperature frozen food cases. Otherwise, the skin of the bird will dry out and take on a hard, pocked appearance. However, when the retailing is done from the ordinary display case (40 to 50 deg. F.), this moistureproof wrapping material provides a surface for moisture condensation during the thawing of the bird. If allowed to form, the condensed moisture masks the pleasing appearance of the bird.

RETAILING of ready-to-cook poultry may be carried on from frozen food retail boxes which maintain a temperature of 0 deg. F. or below. At this temperature, the

Eviscerated birds are thoroughly washed in high-pressure spray for removal of blood spots, viscera particles and air-borne microorganisms.

keeping quality of the poultry is not a serious problem if the transportation from factory to distributor and retailer has been carried on under adequate refrigeration.

At present, a large volume of ready-to-cook poultry is retailed from ordinary meat display cases at temperatures around 40 deg. F. Under these conditions, pock-marking, because of dehydration, is not a problem but the keeping time is limited to several days. Wrapping in a nonmoistureproof transparent cellulose provides a more attractive package than does the moistureproof grade, particularly when thawing is taking place.

Rapid freezing to get best results requires temperatures from –5 to –20 deg. F.

Through the controls and checks exercised in the selection of the birds and in processing, packaging, freezing, storage and delivery to the retailer, packaged poultry has many advantages over bulk dressed poultry. These advantages include: (1) Saving of transportation cost for unused portions (heads, feet and intestines). (2) Convenience to consumer who buys the bird as a brand-identified product ready to hand across the sales counter. (3) Promotion of sanitation in retail markets, as no messy drawing at point of sale is done. (4) Accuracy in weights, each bird being marked for net weight when wrapped before freezing. (5) Preservation of good eating qualities at fresh-flavor peak. (6) Convenience in packing to provide small units for retail stores. (7) Attractiveness in display to provide heightened eye appeal to prospective buyer. (8) Excellent keeping qualities that make possible the holding of stocks throughout the week at retail stores.

Shaping and wrapping of the birds before freezing require skilled technic to produce a package with eye appeal.

The food-plant engineering that has made these eight advantages possible has advanced poultry packing from a back-of-the-store side line to an industry housed in up-to-date plants operated under controlled conditions.

How Fine Is FINE GRINDING?

A new method of testing chocolate, cocoa powder, and other fat-containing materials helps to set specifications or standards for fineness of grind for both makers and buyers.

By LEO FREUNDLICH
Hooton Chocolate Co.,
Newark, N. J.

FINENESS is frequently an important physical quality in determining the fitness of some materials for specific food uses. Means of determining this quality have value to the maker of the material as a production control method and to the user as a step in controlling the quality of his product.

When the material under test is a dry powder, sieves with screens of standard construction and mesh size are most generally used and serve the purpose well, whether the material is forced through the screen by shaking or brushing. The percentage relationship of the coarse particles remaining on the screen to the weight of the sample tested indicates the degree of fineness of grind and serves as a guide to the suitability of the material for the intended use.

When the material is a fat-containing one, the screen test is open to criticism if not unusable. Much depends upon the fat content of the material under examination.

In the case of chocolate and other high-fat materials, microscopic examinations have taken the place of the screen test. Often a micro-projector or a photo-micrographic camera is enlisted to aid in the microscopic examination. (A. A. Lund, Manufacturing Confectioner, March, 1938, page 20.) However helpful the microscopic examination may be, it cannot be relied upon because of the extremely limited portion of the sample that can be seen in a microscopic field and because of the difficulty of getting the particles properly distributed in a field to make accurate examination possible. The method is particularly inadequate when any properties of the material under test are to be expressed in relation to its fineness.

FOR DETERMINING and evaluating fineness in fat-containing materials I have found that the following procedure gives satisfactory results.

Instead of sieves or a micro-projector, the essential piece of apparatus is a metal filtering cup having the shape and size of a laboratory crucible and a bottom of screen of standard construction and mesh size commonly used in sieves for the determination of fineness in dry powdery materials. The screen is preferably made from bronze wire. The cup is preferably of any metal to which the screen may be attached by soldering. However, soldering is not essential as the screens may be fitted to the cup by means of a flange.

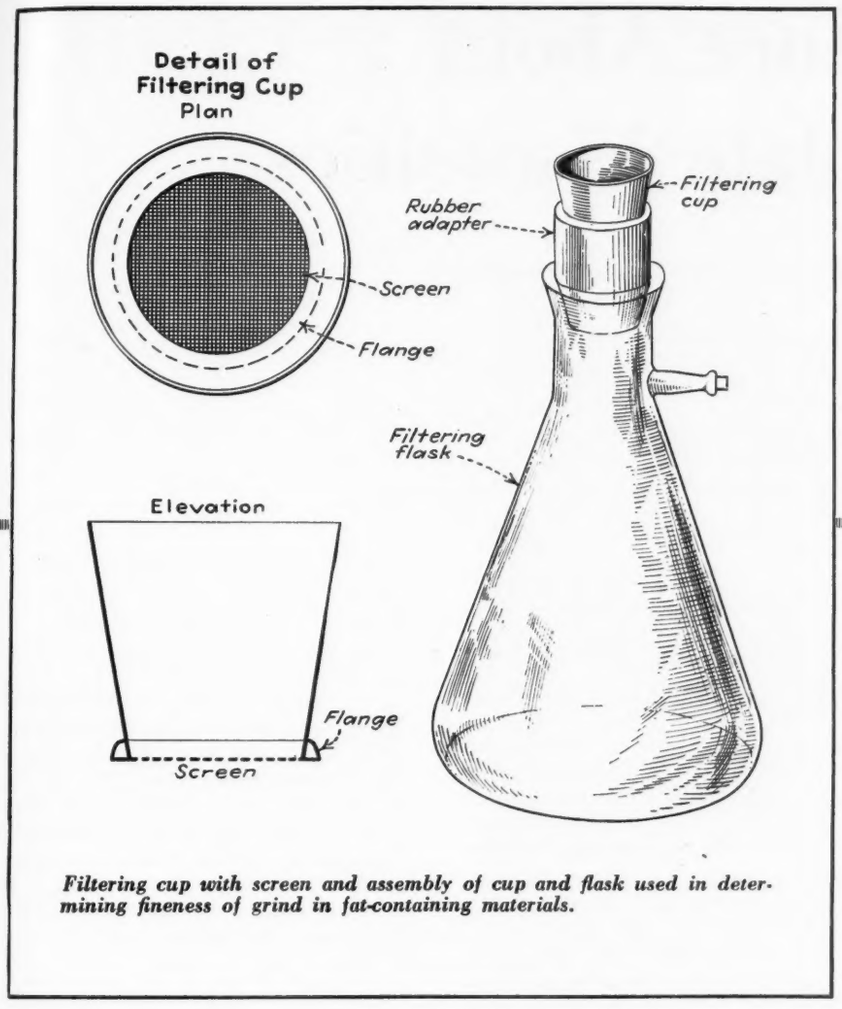
The screens may be of such mesh designation as wanted. At present I am using cups with 100, 200, and 300 mesh screens.

The cup with the finest screen of interest in the case of the test being made is set into a suction flask by means of a rubber washer, adapter or any other suitable device. Ten grams of chocolate, solid or, preferably, melted, are weighed in a tared 100 cc. lipped glass beaker. About 20 cc. Halowax Oil #1000 are added and the chocolate is disintegrated by heating to about 130 deg. F., mixing and stirring constantly with a glass rod. If the chocolate is melted, mix thoroughly before applying heat. Filter the contents of the beaker through the cup, stirring the screen of the cup with the glass rod to promote passage of the fine particles. Very moderate suction may be applied but is not necessary. Wash first with several portions of Halowax Oil, always stirring the contents of the cup, then wash quickly, first with two small portions of perchlorethylene, then with two small portions of carbon tetrachloride and immediately place the cup in a preheated drying oven. Each portion of solvent used for washing is also used to transfer the disintegrated chocolate quantitatively from the beaker into the cup and each portion should be heated in the beaker to about 130 deg., F. (The temperature can be estimated, as more or less, within a considerable range, does not matter.)

In place of Halowax Oil, diethylphthalate or any other solvent giving a comparable result may be used. To be suitable the vapor pressure of the solvent must be low and it must permit quick filtration.

THE DRY CUP is permitted to cool in a desiccator. The residue is brushed with a 1 inch flat brush until not more than 2 milligrams pass the screen per minute. The residue is then weighed by difference and expressed in per cent.

If desired, the residue is transferred into a coarser cup, and again brushed until not more than 2 milligrams per minute pass the screen. Again the residue is weighed by difference and



Filtering cup with screen and assembly of cup and flask used in determining fineness of grind in fat-containing materials.

is then expressed as a per cent.

When desired, the residues may be freed of sugar and other water soluble substances by washing on the screen with water after the fat is removed. To speed up drying the water wash is followed by an alcohol and then with an ether wash. While some of the water soluble material may be cocoa or similar material, it is substantially sugar. When greater accuracy is desired, the usual recognized analytical methods should be used for the determination of the sugar content of the residues.

Standards for the percentage of chocolate or other fat-containing material passing a definite screen mesh can be readily established for any type of material made or bought.

If the material under test is a cocoa powder or a similar relatively low fat-containing powder, 10 grams of the material is weighed into a 400 cc. glass beaker and enough hot water is stirred in to make a smooth uniform paste. After about 300 cc. more hot water is added and the solids stirred into full suspension the contents of the beaker are poured into an 8-in. diameter sieve having a screen of the desired mesh fineness. Cold water from a faucet is run upon the residue on the screen until no more cocoa material passes the screen. Part of the wash water is used to transfer the powder material to the sieve in a quantitative manner.

The residue on the screen is rinsed back into the beaker with water and poured into a filtering cup with the same mesh screen as used on the sieve. After the transfer to the cup has been made quantitatively with water, the residue is washed several times with small quantities of alcohol and then several times with ether preliminary to the application of moderate heat in a drying oven.

Net weight of the dried residue is calculated as the fat-free water insoluble portion of the cocoa powder or material under test. In the case of cocoa powder about 30 per cent of the fat-free material is water soluble. Consequently, the percentage of coarse cocoa in the 10-gram sample used is obtained according to the formula

$$\frac{1000W}{0.70\ (100-f)}$$

W = Weight of coarse fat-free, water-insoluble residue in grams.

f = per cent cocoa butter content of the powder.

As in the case of the chocolate, the residue material may be transferred to a coarser screen and further evaluated after brushing if desired.

An alternate procedure for cocoa powder may be followed by weighing 1 gram of the powder into the filtering cup and placing it in a cool room for at least 5 minutes. After brushing with a soft brush until less than 2 milligrams material pass the screen per minute, the net weight of the oversize residue may be determined by deducting the tare weight of the cup from the total weight of cup and residue. To express in per cent of the sample used, multiply the net weight of the oversize residue by 100.

In some instances, more or less than 1 gram of the powder may be used. In that case the residue percentage is obtained by using the formula:

$$\text{Per cent residue} = \frac{100\,W}{S}$$

W is the net weight of oversize in grams.

S is the weight of the sample in grams.

While the details of the methods given apply particularly to chocolate and to cocoa powder, the filtering cup with the screen bottom may be conveniently used for testing almost any material for fineness of grind by following suitable modifications of the test.

▶ ***While some of the procedures followed to determine certain properties or qualities of raw materials, or goods-in-process, border on laboratory technic, they are of value to production men as another yardstick for evaluating or a means of controlling the quality of the products they make.***

Fineness of particles in materials made or used is of such importance throughout food manufacture that the methods described in this article have value to

Most Food Manufacturers

More About Chocolate Viscosities

New method of determination

Dorchester, Mass.—In accordance with intentions stated in my letter published in Food Industries, January, 1938, we have compared Dr. Freundlich's method of viscosity determination (Food Industries, November, 1937, p. 630) with our method for chocolate coatings.

The difference between the two methods may be summarized briefly. By Dr. Freundlich's method a quantity of chocolate is melted at not exceeding 130 deg. F. for a plain dark sweet and at not exceeding 115 deg. F. for a milk chocolate. The temperatures usually range from 105 to 115 deg. F. The chocolate may be melted directly in the McMichael viscosity cup or placed in the cup in a molten state. In either case, it is cooled to 95 deg. F. and a reading taken on the McMichael viscosimeter using a No. 24 wire, a 2-cm. diameter plunger immersed 3 cm. in the chocolate, and a 35 r.p.m. turn-table rotation.

By the method we use the chocolate is melted in the same manner as in Dr. Freundlich's method, except that we do not exceed 120 deg. F. for plain dark sweet and 115 deg. F. for milk chocolates. The melted chocolate is cooled to 100 deg. F. at which temperature the viscosity reading is made. We use a No. 27 wire, a 2-cm. diameter plunger immersed 2-cm. in the chocolate, and a 20 r.p.m. turn-table rotation. The obtained viscosity reading is multiplied by 2.

Our check tests show the following comparisons in viscosity determinations:

Chocolate Number	By Walter Baker Co. Method	By Dr. Freundlich's Method	Ratios of W. B. C.'s to Freundlich's Results
1.....	488	128	3.81
2.....	306	83	3.68
3.....	362	98	3.69

On the basis of the calculated ratios, one degree McMichael by Dr. Freundlich's method is equivalent to an average of 3.73 degrees McMichael by the Walter Baker Co. method.

We carried the viscosity determinations a step farther using the Walter Baker Co. method, but in one case a No. 27 wire and in the other case a No. 32 wire. All the determinations were made on "ice-coats", to see if greater accuracy could be obtained by using a No. 32 wire. Our results were as follows:

"Ice-Coat" Number	Viscosity by No. 27 wire	Viscosity by No. 32 wire	No. 27 wire to No. 32
1.....	21	213	10.1
2.....	9	94	10.4
3.....	13	131	10.1

On an average one degree McMichael on a No. 27 wire is equivalent to an average of 10.2 degrees McMichael on a No. 32 wire. The method used for "ice-coats" varies slightly from the Walter Baker Co. method described, in that the 2 cm. diameter plunger was immersed 4 cm. in the chocolate and the reading used as indicated instead of being multiplied by 2.

The significance of this second test is that with very careful manipulation and by the use of a No. 32 wire, the viscosity of an "ice-coat" can be determined to within several tenths of a point as compared to that obtained with a No. 27 wire. The reading of one wire under the same set of conditions can be compared with those of another wire by the following equation which gives the ratio of the viscosity readings of one wire in respect to those of another.

$M°$ factor (within small error allowance) $= \left(\frac{d1}{d2}\right)^4$

$d1$ = diameter of the No. 27 wire.
$d2$ = diameter of the No. 32 wire.
$M°$ = degrees McMichael.

Upon applying the equation to the two wires in question (No. 27 and No. 32) we obtain:

$$M° \text{ factor} = \left(\frac{0.01419}{0.00795}\right)^4 = (1.7848)^4$$

$$= 10.15$$

a result that bears out the ratio determined in actual practice within the limit of a small degree of error.

By the use of this equation, which was given us by Joseph Stanley of the W. A. Cleary Corp., New Brunswick, N. J., and using the diameters of Nos. 27 and 32 wires as given in Eimer and Amend Bulletin No. 280, page 8, one can determine the gage of the wire or wires most suitable for determining the viscosity of the particular type of chocolate to be tested.—Benjamin J. Zenlea, *Chief Chemist, Walter Baker & Co., Inc., Dorchester, Mass.*

Larger Machines More Efficient

Newark, N. J.—The points brought out under the above title in a recent number of Food Industries are well worth bearing in mind, because they apply to nearly all types of machines.

Take, for example, electric machinery. The size of the electric motor has much to do with its efficiency. The smaller the motor the lower the efficiency, usually. The average efficiencies of generators and motors at full load are about as follows:

Direct-current generators 50-kw., 90 per cent; 100-kw., 91 per cent; 1,000-kw., 93 per cent. Motors: ¾ hp., 64 per cent; 5 hp., 80 per cent; 15 hp., 84 per cent; 30 hp., 90 per cent; 150 hp., 92 per cent. Alternating generators; 50-kva., 90 per cent; 100-kva., 91.5 per cent; 500-kva., 94.5 per cent; 1,000-kva. and over, 95 per cent. Motors: 1 hp., 76 per cent; 10 hp., 85 per cent; 100 hp., 90 per cent; 200 hp., 92 per cent.

The same is true of steam engines, turbines, diesel engines, gas engines, gears, power transmission, belting, etc. In fact, the writer knows of no instance in which a small machine has proved to be more efficient than a large one.—W. F. Schaphorst, M.E.

LOCKER PLANTS . . .
A New Food Industry

Part I

By IVAN C. MILLER
Distribution Editor, Food Industries

Modern frozen food locker plant in Oklahoma. This is a full service plant.

LONG BEFORE quick-frozen foods were produced commercially, sportsmen preserved their fish, birds and game for use after the hunting season by a process now called "Sharp Freezing." This freezing of foods for the individual has become an industry, national in scope, known at present by several names, "refrigerated food locker service," "cold storage locker system," and "frozen food locker system." The plants providing this service are generally called "locker plants."

Locker plants have grown out of the need of the individual for a better method of preserving foods of his own production. The sportsman and the farmer were the two who most needed an improved method of holding fresh meat and poultry in preserved condition for future use.

At first, low temperature storage plant owners accommodated friends by providing small space in a low temperature room for the storage of frozen game and meat. The results brought requests for storage space from others who learned of the advantages of freezing meat to be consumed months later. Thus a profitable sideline developed for a few plants with available space in low temperature storage rooms. In the last few years this sideline has become the major function, often the only function of many refrigeration plants.

The first users of the cold storage warehouse for the storage of products for family use, stored these foods in baskets and boxes bearing tags of ownership. These were stacked on the floor, one on top of another. Later shelves with compartments were built on which renters stacked their baskets and boxes. Wooden lockers soon followed. These eliminated petty pilfering as well as avoidable mistakes. They were, however, crude and unsightly—scarcely the equipment on which to build a growing business. The real expansion of the industry has come in the last four years with the introduction of the enameled steel locker.

Low temperature refrigeration space is rented to individuals for storage of their own frozen foods in at least 32 of the States. However, not all of these plants are modern. The table shows the number of locker plants for each state. Included in this list are many basket plants as well as the new type of steel locker plants. The size of these plants varies from those having ten to twenty patrons up to those serving as many as 1,500. This list by states is only an approximation which, however, does give an indication of the distribution of locker plants and the areas where they are concentrated. No list can be accurate for long. The growth of locker plants is too rapid.

Many estimates have appeared in print, placing the number of locker plants as high as 3,000 and the number of families using locker facilities as high as from 800,000 to a million. Most authorities consider these estimates high even though they cover all the heterogeneous groups large and small, which provide low temperature refrigerated space for individual use. The number of plants which can be correctly classed as locker plants in the modern conception is not over 500.

The first locker plants, started more than twenty years ago, began as sideline projects in ice companies and creameries. A large percentage of the locker plants in recent years have been built, not in connection with an established business, but as separate business enterprises launched only to provide low temperature storage space in which individuals could store frozen foods for family use. The accompanying table, the result of a survey of 136 plants, indicates the types of business with refrigeration equipment which have added locker plants to their other operations and also the percentages of operations which have been started primarily to furnish locker service to individual patrons.

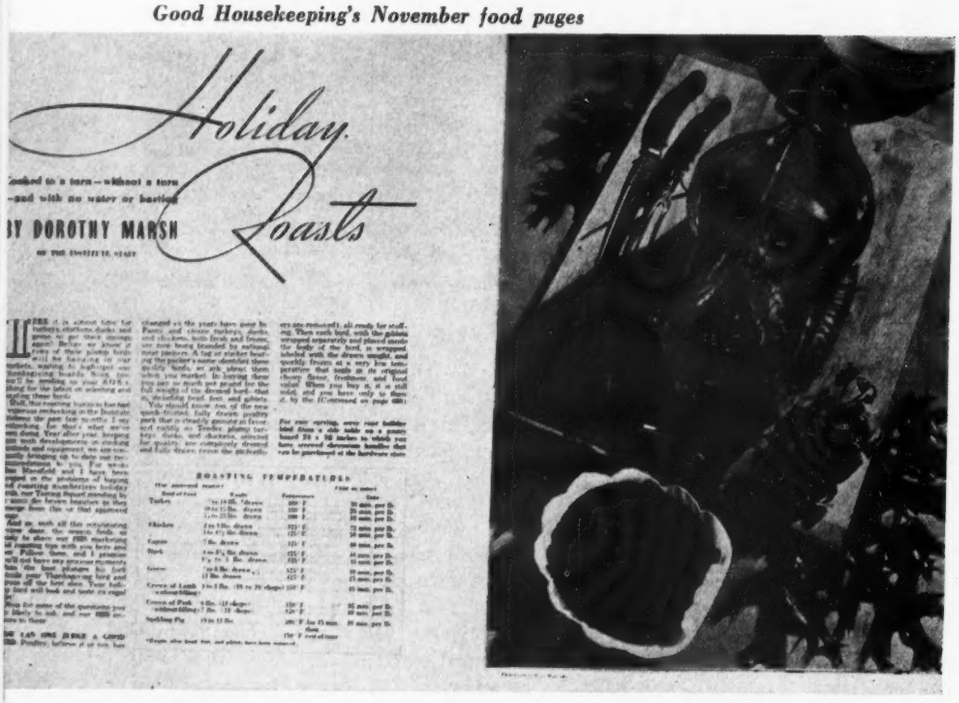
Locker plants may be classified in two groups according to whether they are operated in connection with established businesses requiring refriger-

(*Turn to page 568*)

POSTERS for the Holiday Season

These food pages, which will appear in the November issues of the women's magazines, may be used as window posters to stimulate holiday sales.

Good Housekeeping's November food pages


Holiday Roasts

BY DOROTHY MARSH

ROASTING TEMPERATURES

November food pages of Ladies Home Journal

TESTS MADE with the cooperation of both independent and group retail organizations to determine the promotion value of women's magazine food pages have been reported in earlier issues of FOOD INDUSTRIES. These tests have proved two facts. Retailers generally welcome this type of display poster more than other types, and cooperate in giving it an opportunity to produce. This type of poster, made by mounting reprints of the illustrated food pages of the women's magazines, produced pronounced increases when used to stimulate sales.

As a result of these tests, FOOD INDUSTRIES arranged with the women's magazines to obtain advanced proofs of these pages. The purpose of obtaining these advanced proofs is to describe and illustrate the forthcoming food pages of the women's magazines so that manufacturers whose product or products are among those featured may obtain ready-for-use posters bearing reprints of the food pages and place them in the hands of retailers at or about the same time the magazines reach their readers.

Mounted reprints of these food pages (single pages on 14x22 in. poster board, spreads on 28x22 in. poster board) may be obtained from the magazine ready for use at the following prices:

Single Page

1,000 to 1,999 inclusive each	15¢
2,000 to 2,999 inclusive each	12¢
3,000 and over each	10¢

Two-Page Spread

1,000 to 1,999 inclusive each	25¢
2,000 to 2,999 inclusive each	18¢
3,000 and over each	16¢

Woman's Home Companion food pages for November

Manufacturers may either correspond with any one of the magazines direct, if interested in food pages appropriate for their products or write to the distribution editor of FOOD INDUSTRIES.

Each poster will carry the printed line "As seen in the November issue of ..... Magazine." The manufacturer's own selection of caption or "selling slug" such as, "Try these recipes suggested by Woman's Home Companion," "Thanksgiving is Turkey Time," "Holiday Season is Here," etc., will be printed at the top of the poster. No poster will bear the name of the manufacturer or his trade brand.

These food pages will appear in Pictorial Review-Delineator in November

LADIES HOME JOURNAL: Full-color spread suitable for promoting packaged poultry, canned or frozen corn on the cob and canned pumpkin.

PICTORIAL REVIEW-DELINEATOR: Two-color spread which may be used to promote sale of canned pumpkin, cocoa, chocolate and cake ingredients.

McCALLS: Full-color spread suitable for promoting packaged, drawn or frozen poultry, canned sweet potatoes, beets and pickled onions.

GOOD HOUSEKEEPING: Full-color spread suitable for stimulating sale of poultry and canned cranberries.

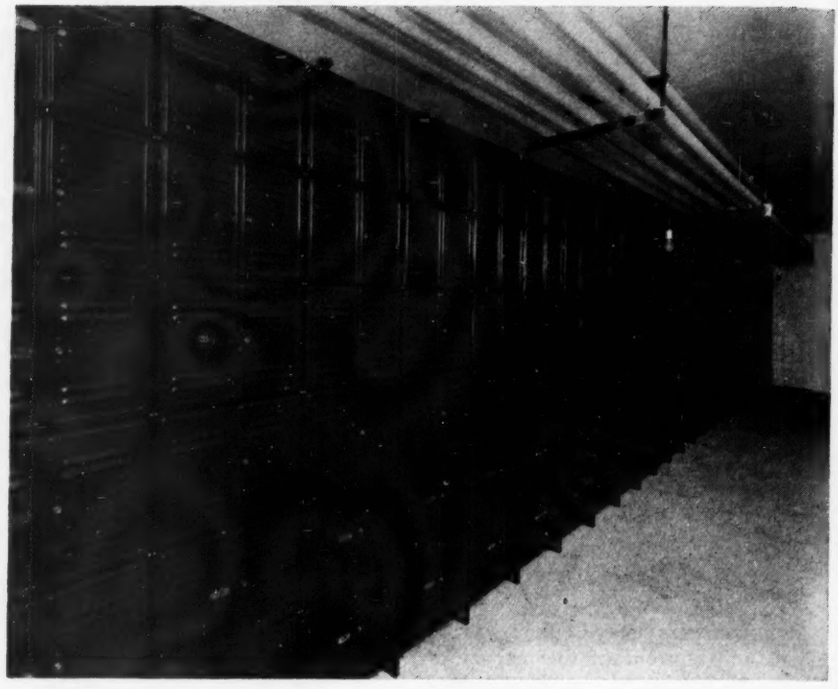
WOMAN'S HOME COMPANION: Full-color spread suitable for the promotion of packaged, drawn or frozen poultry, canned pumpkin, green beans and oysters.

These pages will appear in November in McCall's

ated equipment or whether they were established primarily to provide locker service for the storage of the individual's frozen foods. They may be classified also according to the type of service rendered to patrons—"limited service" or "complete service."

Limited service locker plants are usually operated in connection with an established business such as an ice plant, creamery, or cheese factory. In these locker plants, one room is maintained at a temperature from 0 to 10 deg. F. In this room, provisions are made for families to store their own supply of frozen foods, in bins, baskets or lockers. Each renter places in his storage space whatever he chooses, whenever he chooses, and withdraws his frozen food products at will. Even left-over fried chicken and roast beef find their way into some of these lockers. With the scant instructions, if any, furnished locker patrons, and with the variable temperatures employed at the start of this industry, it is little short of miraculous that the industry survives. Yet year after year, farmers plunk down the $5 to $10 rent, fill their baskets or lockers with meat, poultry, fruits and vegetables and thankfully pocket the $25 to $100 annually saved. The greatest number of locker plants offer only limited service.

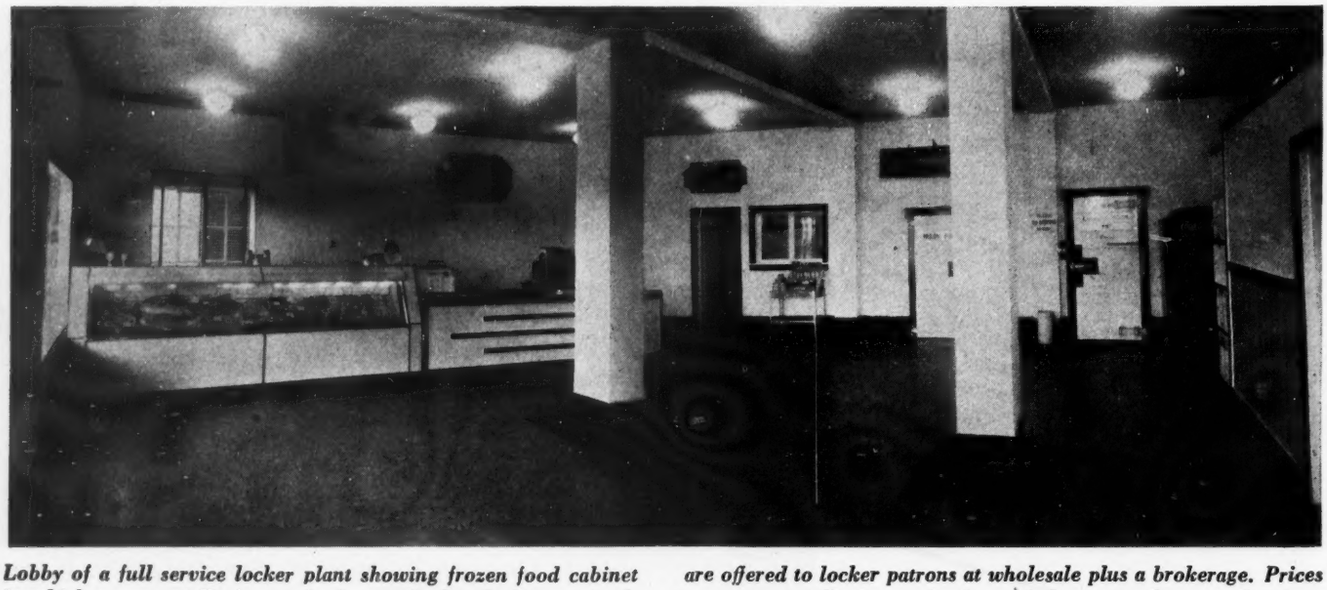
The customers of the limited service type of locker plant are mostly farmers, many of whom live 10 to 30 miles away from the plant. What considerations can induce farmers living 10 to 30 miles from a locker plant to become patrons and to continue year after year carting their daily meals to and from a locker plant miles from home? Farm families usually butcher their own meat and smoke, salt or can it for future use. Fruits and vegetables likewise are canned. These products are kept on the farm ready for immediate use, not in the cold storage plant many miles away. However, many farm families consistently use and admittedly prefer the frozen foods from the locker plant miles away, to the food produced by their own industry and kept on the farm.



Interior view of locker plant showing five tier lockers. These lockers are in rooms generally held at a temperature between 0 and 10 deg. F. They have a frozen food capacity of between 250 and 300 lb. each and are rented to patrons by the year at from $8 to $12.

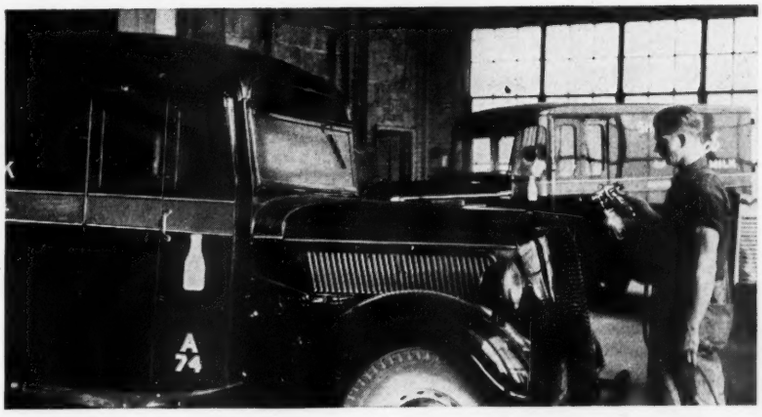
Since the adoption of the truck and automobile as necessary farm equipment, some member of the farm family comes to town every week, bringing in farm products for sale, carrying out supplies for the farm. Those families with frozen foods in locker storage carry out a week's supply of frozen foods when returning from the weekly trip to town. Often a neighbor brings home the weekly frozen food supply for several adjoining

(*Turn to page 590*)



Lobby of a full service locker plant showing frozen food cabinet in which commercially frozen foods are displayed. Frozen foods are offered to locker patrons at wholesale plus a brokerage. Prices on commercially frozen foods are below prevailing retail prices.

When Does It Pay To Operate a Paint Shop?



What food executives say about it

IT IS NOT SO SIMPLE as it seems for a food company executive to decide whether to operate his own paint shop, have this work done outside or have a painter come in on contract. Yet it is important that the proper decision be made, because painting is a sizable portion of total maintenance expense. To bring out points bearing on this problem, the symposium below is presented.

One-man Shop Uneconomical

There is no question but that painting and body work are becoming very sizable items in connection with the total maintenance of motor vehicles, this being on account of traffic hazards rather than the type of materials or method of application.

Regarding the economy of a company operating a paint shop for trucks and commercial cars, there is no question but what certain large concentrated fleets can operate their own paint and body shops more economically than going to outside shops for such work. However, the small local fleet cannot afford to operate any type of paint shop. A one-man shop is not economical. Neither does it turn out good work, as any one man that is good enough to do refinishing is too good to do the ordinary clean-up work.

The difficulty in a two-man shop is that the average small fleet cannot maintain a uniform volume of work, as the majority of paint work is done in the spring and fall months.

Under certain circumstances, it can be more economical to have contract painters work on the premises. This only, however, in cases where paint shop facilities are available due to abandoned space. Under no circumstances would it pay to set up special paint facilities in an attempt to bring in contract painters.

It is never advisable to attempt mechanical body repair work in the same department with painting. These of necessity must be separated both from the physical and supervision standpoint. And here again you are confronted with the problem of steady volume. However, a body repair man can be diverted to other work fairly successfully and can be developed into a handyman as a mechanic, which may prove beneficial for certain small-fleet shop operations, having in mind that this type of man could patch a roof, put in a floor board, put on a tail gate and so forth.

As far as major body work is concerned, particularly where a great deal of metal work is involved, we find that same can be handled more efficiently and economically through outside repair shops.—F. L. FAULKNER, *Automotive Department, Armour & Co., Chicago.*

Advises Farming Out Work

As to whether it pays to paint trucks at the plant or farm out the work, this depends entirely upon the size of the fleet, labor districts, building facilities, and so on. It is entirely impracticable where small fleets are concerned. And usually one can pay a slight premium for custom work, as competition keeps painters alert as far as quality of the work is concerned. Their prices, especially in an industrial community, are not relatively too high. Except in cases of very large fleets, I would say to farm the work out.

Again, the same situation exists as to repairs—large fleets can afford their own shops, whereas small fleets had best be confined to general maintenance work and leave body building and so forth to custom builders—W. A. GIBBONS, *Progressive Dairy Products Co., Racine, Wis.*

Favors Body Repair

We feel that it is economical for a company to operate its own paint shop for motor vehicles, providing the company has ten or more trucks or commercial cars. To operate a small paint shop of this type would require one man. As for body repair work, we would say that it can be done in the company's own shop at less money if the company has a shop equipped to do it.—T. C. MCCALL, *President, Gibson Canning Co., Gibson City, Ill.*

50 to 60 Trucks for Shop

We believe that it is economical to operate our own paint shop, a fleet of 50 to 60 trucks being ideal for a company-owned shop. A foreman who is capable of lettering and a helper who can do spraying are enough personnel for a paint shop of this size. Contract painter's work is not satisfactory.

Body repair work, with the exception of possible fender repair, is not advisable in a small paint shop.—P. S. HARMON, *Managing Director, Simmons & Hammond Mfg. Company, Division of General Ice Cream Corp., Portland, Me.*

Specialized Body Design Lowers Delivery Cost

Baker also obtains increased route sales from innovations that display his products more attractively

Close-up of a housewife selecting bakery products from a traveling show case on wheels in the form of an International ½-ton, four-cylinder engine route truck with glass-fronted drawers inside the body, as operated by Lang's Bakery, Inc., Buffalo, N. Y. The small engine employed where speed is not essential has reduced route costs and the unusually good display of all the items in the bakery line has increased route sales.

IN THE NEVER-CEASING FIGHT to reduce distribution costs in the food industries, bakers are turning more and more to specialized trucks and specialized bodies to reduce route costs and increase route sales. The specialized truck and body shown herewith is an excellent example.

To understand the meaning of the word "specialized" as applied to trucks, it is perhaps best to go back to the days when trucks first replaced horse wagons. In those days the truck user had to select from the truck manufacturer's standard models that model which most nearly suited his needs.

These standard models in the various tonnage capacity sizes were compromises as to wheelbase, body dimensions, engine size and horsepower best suited to average requirements, were they the hauling of wood, coal or ice or the delivery of milk or bread. According to the weight of load to be carried, the chassis was the same. It was fitted to the industry in which it was to be used by the construction of the body mounted upon it. The coal dealer used a coal body and the baker, a bakery body.

These vehicles served their purposes reasonably well. However, the users in some industries, notably milk and bread, with their multistop, relatively short-mileage routes, realized by experience that these trucks left many things to be desired. It was both hard and slow for the driver to serve his route. In many cases the truck was far overpowered for the work to be done and this resulted in high fuel costs.

The above conditions led to the eventual development of the low-aisle, stand-up or sit-down driven trucks now offered as standard models by many of the truck manufacturers. With the eclipse of the early four-cylinder engines by sixes and eights because of better balance and smoother running, many of the low-aisle route trucks were equipped with the newer engines, which provided more power than required.

Now the trend on short, multi-stop retail routes, where speed is not essential, is back toward the small, redesigned four-cylinder engine because of the saving in fuel costs where the engine is idling for such a high percentage of the route time. Such a truck is the Lang bakery truck shown on these pages.

It is an International Model D-5, ½-ton truck with a small four-cylinder engine and a standard DB type International body especially adapted to localized interior details and constructed to meet the truck owner's specific requirements. A fleet of these vehicles is operated by Lang's Bakery, Inc., Buffalo, N. Y., in the house-to-house sale of bakery products.

Aside from the special features of the chassis itself, the body is highly specialized by a new construction which literally takes the showcase to the customer. This is done by a series of drawers with glass fronts.

As shown in one of the accompanying illustrations, the body is divided into three parts. These consist of a compartment near the top with sliding doors; two pull-out drawers at the bottom and in between, fifteen glass-fronted, pull-out drawers arranged in three crosswise rows, with five drawers in each row. Loaves of bread are carried in the upper and lower compartments and cakes, jelly-rolls and other of the various Lang baked goods in each of the drawers.

With the type of customer served indicated by the typical homestead in the background, this view of the Lang house-to-house bakery truck shows its general make up; the low-floor driver's aisle and low entrance step which makes it easy for the driver to get in and out of the body. Also note the change purse on the driver's left hip.

On city, small town and rural routes where the custom is for the housewife to come out on the sidewalk to purchase vegetables, meats, fish and bakery goods, this Lang glass-fronted shelf arrangement permits the housewife to see the fresh, clean bakery products without the necessity of the driver-salesman removing them for inspection. The variety of the goods offered and their attractive display has increased sales to old customers and helped to secure new ones.

In addition to the sales advantage of the drawer arrangement, it satisfies two other important requirements. These are the carrying of the various items without breakage in transit and the avoidance of contamination of goods by dust, which is always present in the air and which is an especially important consideration in the rural areas with dirt roads.

While all of the products are wrapped in transparent cellulose sheet, the tightly-fitting drawers serve as an additional means of keeping dust off the packages. This is aided by still another feature of the body construction, namely a solid rear end with no doors or openings of any kind. Thus no dust stirred up by the truck while running along the road can find its way into the body from the rear. On the run from the bakery to the first stop and between long stops on the route, two-part folding doors at each end of the driver's crosswise aisle may be closed to keep blowing dust out of the front of the body.

For use on any portions of the route where it is not the custom for the housewife to come out on the sidewalk to select her goods, the driver is provided with a conventional fiber basket with a handle and also a special three-tray carry-all shown in the illustration at the bottom of this page. This carry-all has a usual handle and the edges of the trays or shelves have slightly-projecting enclosing bands which serve to keep the goods from sliding off onto the ground if the driver is careless and does not keep the trays level when carrying them to the housewife's kitchen door.

The use of this carry-all permits the driver to take into the customer's house a larger number of the items in his line than can be carried in the conventional, one-bottom type of basket unless the products are piled on top of each other. Such piling is undesirable because of possible breakage of the items on the bottom, lack of adequate display, and excessive handling of the goods.

Another feature of the body is the size of the lettering of the Lang name on each side. This is made small enough to permit the use of special sale advertising signs slipped into metal frames on the body sides and to permit the two-part, drivers-aisle doors to be folded back against the body on the outside without covering up the company name.

The type of Lang truck shown herewith is but ont of a total fleet of over 200 trucks, mostly operated out of Buffalo, N. Y. The Lang company, which was established in 1840, also sells its products in the nearby cities of Niagara Falls, Batavia and Jamestown. Various types of route trucks are employed, according the route mileage and type of customer served; but the specialized travelling show case on wheels depicted on these two pages has met the requirements of lower route costs and increased route sales.

By the use of small lettering for the company name, the latter is not covered when the two-part door is folded back against the outside of the body. There is also room for the special sale sign placed in the metal frame at the rear of the body side panel. Note the special, three-tray carry-all inside the body, used by the driver to take into the customer's kitchen a larger number of bakery items than can be carried in the conventional, one-bottom basket.

Merchandising HINTS AND HURDLES

Can Company Employs Puppets

AT THE CONVENTION of the Associated Coffee Industries, held at French Lick Springs, Ind., in September, the American Can Co. gave the first public showing of their educational film on coffee, entitled "Jerry Pulls the Strings." This film of puppet actors and actresses pictures the historical growth of the coffee industry including a trip through a modern coffee-roasting plant where coffee is vacuum packed in cans. This 40-minute marionette film is to be released through the Can Company's Home Economics Department to schools, churches, and club groups. The success of this enterprise may open up not only a new method of promoting sales, but also a new method of promoting consumer understanding and good will.

Scene from American Can Company's filmed puppet show which promotes coffee and vacuum packed cans.

Co-Ops for Pea Canners

THE PEA CANNERS, facing a heavy carry-over and falling prices and a frozen pea competition which cannot be ignored, have formed an association known as "The Canned Pea Marketing Cooperative." The objectives of this newly formed association are to improve market conditions in the canned pea industry through the collection and dissemination of statistical data, through the promotion of uniform grades and standards, by keeping a running check of shipments and balances, by estimating price ranges, and in general by developing better merchandising and marketing of canned peas. The canned pea marketing cooperative is an open-price association.

A Double-Edged Sword

THE NEW Federal Food, Drug and Cosmetic Act, passed by Congress on June 25 of this year, to become effective one year from date, has had the expressed disapproval of some food manufacturers and but half-hearted lip service from other manufacturers who secretly disapprove the act. True, the act may work considerable hardship on some food manufacturers, but it is a double-edged sword and cannot fail to bring some definite benefits to the industry. The law permits the Secretary of Agriculture on his own initiative or upon the request of a substantial portion of the industry, to hold public hearings and, after due procedure, establish standards for any food product. This should only handicap materially those known to the industry as "chiselers."

The new law requires every manufacturer of food products whose products move in interstate commerce to subject his plant to Federal Government inspection. This prerogative was denied the Federal Government under the old law of 1906. Some food manufacturers take exception to this part of the law on "general principles" considering the law an invasion of rights, secretly counting the possible cost necessary to put their plants "in condition." The meat packers objected strenuously when federal inspection was thrust upon them. Few meat packers under federal inspection would part with the service today. Here again the law is a double-edged sword. It must be admitted that many food plants are not sanitary. The food manufacturer who employs a high standard of sanitation in plant and product is at a disadvantage competing with plants which avoid the expense of proper sanitation.

The law will affect adversely the undesirables in the industry. This new Food law together with the law resulting from the Wheeler-Lee Bill, will steal the thunder of those who reap a neat income at the expense and irritation of food manufacturers by condemning the manufacturer's product before consumer audiences. The manufacturer whose products conform to the new laws should have little to fear from these agencies. These laws are double-edged swords. It will be but common sense to keep the sharp edge towards the enemy.

Industry Agreement Can Boomerang

THE CALIFORNIA CLING PEACH AGREEMENT was launched with the high hope that it would bring order out of the chaos the industry was fast approaching. When the peach agreement was launched something had to be done. The situation was little less than desperate. The carry-over was excessive and prices were ruinous. Those participating in the agreement attempted to determine the average cost of producing canned cling peaches and to place a price floor that would prevent sales at a loss. The price for No. 2½ peaches was pegged at $1.55 a case, to be in force until Aug. 1, 1938.

When the agreement went into effect wholesalers, anticipating a price

drop, delayed buying and reduced inventory to a minimum, knowing a price reduction would follow at the end of the price-control period. During this period, jobbers did not push peaches, and retailers used stock on hand and then bought but sparingly. The result of this attitude on the part of the middleman effected a shift of consumer buying to competing canned fruits, especially pineapple.

It is no mark of astuteness to know that markets are maintained more easily than regained. The result of this whole situation is that California packers of cling peaches will limit output this year to some 5,000,000 cases, smallest pack since 1918, which will bring the stock on hand including the largest carry-over in history, to 10,600,000 cases. Furthermore, growers will receive about $12 a ton for raw fruit instead of the $40 they got last year. This situation follows on the heels of a market drop to $1.20 per case for choice grade California cling peaches, the lowest since 1932.

The results of the $12 per ton price to growers has impelled an official demand by the California Farm Bureau Federation to the United States Department of Justice for an immediate investigation of the character of organization and operation by the Canners Industry Board. The canners are in an aggravated position with producers on one side, disgruntled with low prices, and financing banks on the other side hesitating to advance sufficient money to go very deeply on purchases without some assurance that there will be a bottom under the sales price on the new canned pack.

Probably little in this whole situation could have been anticipated. Having happened, it is something for other branches of the food industry, anticipating a similar operation, to cogitate over.

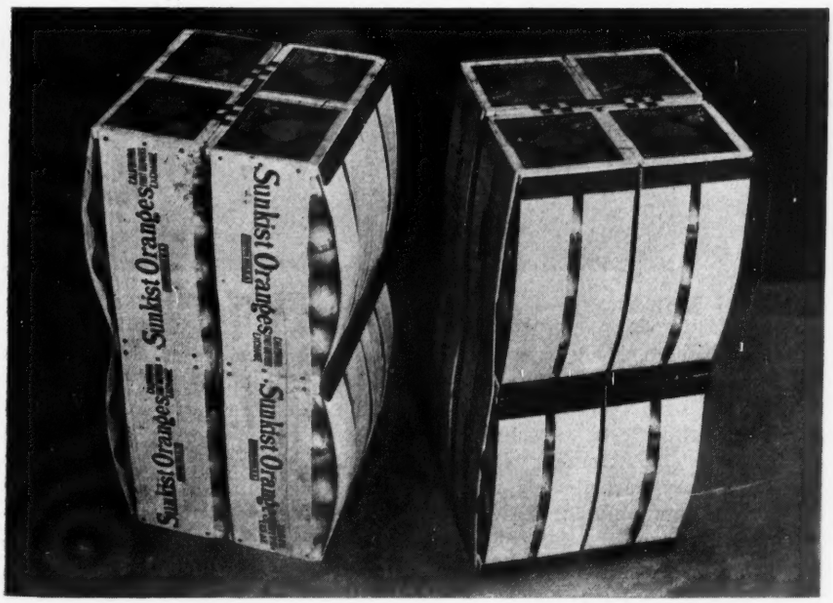
Shifting Distribution

WHEN WE THINK OF CANDY, nuts and carbonated beverages, we are more likely to associate those products in our minds with drug stores than with grocery stores. A commodity analysis of retail food sales in Pittsburgh, taken from the Census of Distributions, reveals some surprising facts as to where consumers buy certain foods. Grocery stores, this analysis reveals, sold more candy and nuts than drug stores—more than variety stores, and approximately as much as candy stores. The latter are not to be confused with confectioneries. It is not unusual to associate bottled beverages with the drug store. However, in Pittsburgh, more than 50 per cent of bottled beverages was purchased in grocery stores and meat markets while only 10 per cent was purchased in drug stores. More than half the bakery products were sold by grocery stores and less than one-third by bakeries.

The food sales of chain drug stores increased 6% during 1937 according to a report of the Department of Domestic Commerce. Not only did volume increase but new products were added to the drug store line. What will be the drug store's attitude when grocery stores sell ice cream as a staple grocery item?

There is a growing tendency to associate prepared meals with the drug store. However, the figure for the percentage of prepared meals sold in drug stores is surprising. Pittsburgh drug stores sold more prepared meals than the cafeterias, more than twice as many as the hotels, considerably more than the lunch counters and lunchrooms, and 60 per cent as many as the restaurants.

Fountain and ice cream sales have always belonged to the drug store and confectionery. The drug store has the bulk of fountain and ice cream sales in Pittsburgh, but the grocery stores makes an impressive showing. The sales through grocery stores were greater than the sales through restaurants, greater than the sales through "fountain lunches." Fountain and ice cream sales in Pittsburgh grocery stores were over $100,000 per year. The commodity index for the United States also presents some surprising facts. Grocery stores sold more cigarettes and tobacco than candy and nuts, more than poultry and approximately as much as milk and cream.



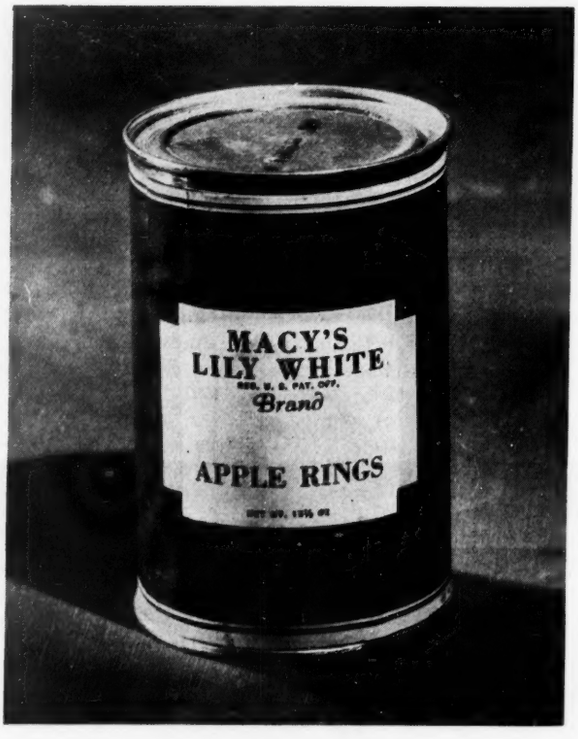
CONSUMER SIZE ORANGE CRATE

An unusual new container, one of the first major improvements in citrus shipping boxes in more than three decades, is being placed on the market by California Fruit Growers Exchange. It is a combination wholesale-retail box, the original, regulation-size package breaking down into halves, quarters and even eights for retail sales. The whole arrangement is comparatively simple. By lifting out a metal clasp on each end and two ordinary staples, with a tool furnished free to dealers, the box breaks up into many attractive retail packages, each like a miniature crate of oranges. The quantity of fruit is stamped on each fractional unit, and is delivered by this method untouched from packer to consumer. Special scored cleats on the units permit easy opening by hand.

New PACKAGES AND PRODUCTS

Peel-Off Beer Cap

A BOTTLE CAP, extensively used in European countries, has recently been introduced here. Pfeiffer beer, product of Pfeiffer Brewing Co., Detroit, is capped with their new aluminum top which requires no other opener than fingers. Although the cap seals against the pressure of beer and carbonated beverages, the metal of the cap is soft enough to permit peeling by hand. This type cap is used in European countries to seal jars containing olives, pickles, jams, marmalades and spreads. Both here and abroad the cap is used for capping milk bottles.



Malted Milk with Vitamin D

PACKARD FOOD PRODUCTS CO., Brooklyn, has recently added another to its family of chocolate drink powders. "Packard Vitamin D Malted Milk," the new member, containing 114 units of Vitamin D per oz., comes packed in 2 lb. compression lid round cans, gayly lithographed in brown, red and yellow. The company's hot chocolate powder is packed in 2½ lb. square cans lithographed red and white.

Another member of the family, chocolate flavored malted milk with yeast, comes in squat 2½ lb. pebbled brown glass jars. All three containers have 3¾-in. openings permitting easy access to contents.

All are consumer packages.

New Canned Apple Rings

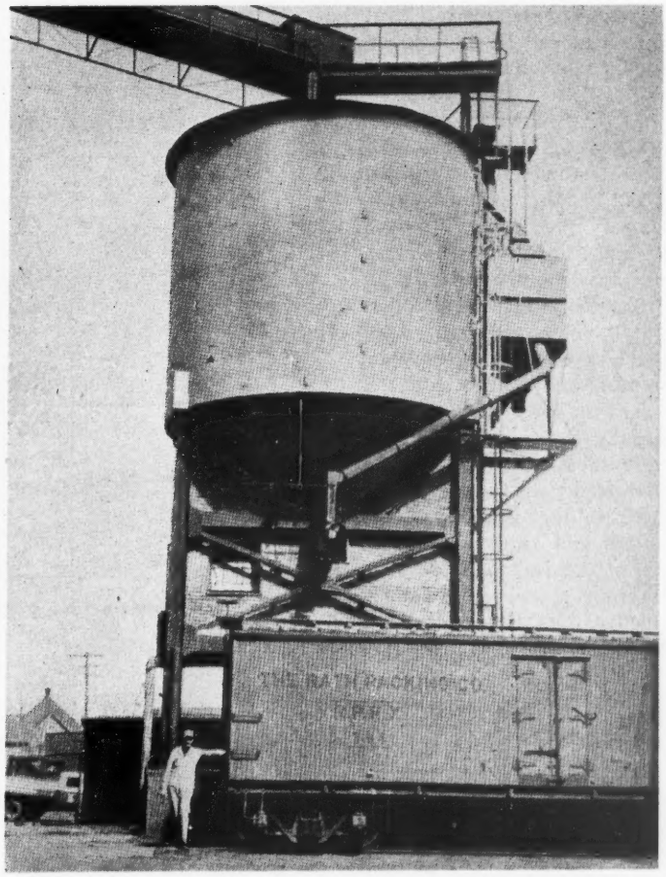
CANNED WASHINGTON STATE APPLES, sliced into rings ready to serve in salads or desserts, have made their appearance on the Eastern market under the brand name "Lily White," trade name of Macy's, New York City.

The PLANT NOTEBOOK

Space Economy in Power Drives

Modern methods of power transmission include several different means of avoiding space-consuming layouts. Very often a re-arrangement of an occasional drive, making it more compact and at the same time more efficient, will save much space.

It has always been possible to use a chain of some type for a short center drive, and modern chain drives are improvements over older types. The most encouraging part of the entire outlook in this matter, however, is the ease with which a truly compact belt drive can now be arranged. The multiple V-belt drive can be and is operated on very close centers. Added to this is the possibility of using the so-called floating motor drive, in which the motor is mounted on a base pivoted in such manner as to maintain proper belt tension through the weight of the motor. Slight lengthening of the belt on a short center drive of this type, due to humidity conditions or to natural belt stretch, does not change the efficiency, for the pivoted motor base will either give or take as the belt shortens or lengthens under varying conditions. — JOHN E. HYLER, *Peoria, Ill.*



Ice briquet storage bin with small salt compartment at the right.

Methods of Icing Refrigerated Cars

Experiences of meat packers and others using refrigerated freight cars have shown that the use of compressed ice briquets is a satisfactory method for keeping the cars cool. Rath Packing Co., Waterloo, Iowa, is using the method and, with products needing temperatures below 32 deg. F., are mixing the briquets automatically with salt. This is accomplished at the time that the ice is placed in the car bunkers, the salt being fed in at the same time in the correct proportions. The salt compartment can be seen in the illustration at the side of the briquet bin.

This method of icing is also in use at the Austin, Minn., plant of George A. Hormel Co.

In operating, a freezer is used which is in general like a cylindrical tank. The walls of this tank are made up of a series of tubular rings. These rings are flooded with liquid ammonia, which produces a freezing temperature on the interior walls of the tank by its evaporation. Water, introduced into the freezer, forms a thin coating of ice on the walls. Revolving scraping arms continuously remove this ice, which drops in the form of fine crystals into a storage bin. Briquets are made from these ice crystals in a briquetting press. These briquets can be varied in weight from 2 oz. each to something over 1½ lb. each, according to requirements of the cooling to be done.

From the briquetting press, the ice briquets are conveyed to a storage bin directly above the track. Gravity feed is then used to fill the bunkers of the refrigerated cars.

Definite advantages of the method lie in its low labor requirement and in the fact that the whole installation requires much less space than is usually needed for an ice plant. Another advantage is that the loss in handling is less than with can ice or crushed ice.

The ice briquets have the same refrigerating value as can ice, that is, about 144 B.t.u. per lb. The moisture content is about the same as that of other forms of ice used in car cooling.—J. E. HUBEL, *Nashotah, Wis.*

Chimney Discharges a Factor in Quality Control

Other than oil and atmospheric dust, smoke, cinders and flyash are perhaps the greatest single source of dirt contamination of materials in the process of manufacture. These solid products of combustion may come from the plant boiler installation or from the chimneys of plants in the immediate vicinity. In either case steps should be taken to eliminate this cause of poor quality or spoilage of product.

Complete air-conditioning equipment, having filters for dirt removal, is the best solution of this problem, and is usually necessary when atmospheric pollution originates in areas not under control of the plant management. Discharges from the plant's own

stack can be minimized by a program of modernization and attention to some of the finer details of furnace and boiler operation. Where air filters are not used, the benefits of any steps in this direction are obvious. If filters are installed, much of the trouble and expense incidental to frequently cleaning this equipment can be avoided by reducing preventable flue dust to a minimum.

In general, gas, oil, and anthracite coal fired boilers, when supplied with sufficient air for complete combustion of the fuel and handled with a reasonable degree of intelligence, produce very little dirt. Soft or bituminous coal fired by hand, with stokers or in pulverized form, is the chief offender.

Stoker and pulverized fuel fired boilers should be equipped with some form of cinder and flyash catchers. While cinder emission from stokers can be partially controlled by careful operation, 60 to 90 per cent of the ash in pulverized coal is necessarily discharged from the furnace in the form of flyash and requires flue gas washers or mechanical separators to prevent it from reaching the stack. There are numerous devices on the market today that perform this function satisfactorily.

Some of the operating pointers whose observance will reduce cinder and other unburned carbon from soft coal fired furnaces are tabulated below.

Stokers.

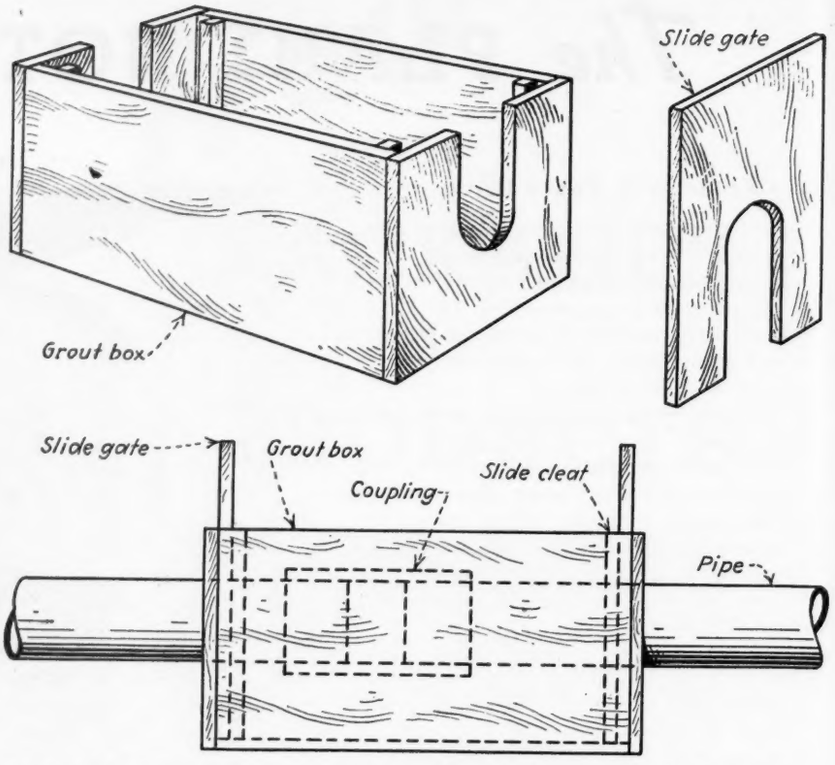
1. Avoid holes in the fuel bed so that high velocity streams of air will not pick up cinders.
2. Clean combustion chambers and other points where cinders accumulate.
3. Check suitability of coal and coal size to the type of stoker and furnace design.
4. Control underfire air and fuel bed thickness so that enough air is provided to consume all soot and smoke forming gases generated by the fuel bed.
5. Introduce enough air over the fire at a velocity sufficient to insure thorough mixing and burning of all combustible gases not burned with underfire air.
6. Keep baffles in good condition so that short circuiting of hot gases does not nullify the precipitation of refuse into cinder hoppers where changes in flow direction occur.

Pulverized Fuel.

1. Adjust burners and air supply so that sufficient turbulence is induced in the furnace thoroughly to mix fuel and air.
2. Adjust flame shape until maximum efficiency with lowest unburned carbon loss is obtained.
3. Check fineness of pulverizer output. Large particles are often carried out of the furnace before they are completely burned.
4. Provide sufficient air for complete combustion.
5. Clean cinder hoppers, breechings and stack bases frequently.
6. Keep baffles in good condition.

Hand fired boilers, while producing very few cinders, usually smoke excessively. This is particularly true when starting fires, adding coal or cleaning the fuel bed.

As a general rule, substitution of oil, gas or mechanical coal firing will do away with these troubles. In the very few cases where modern firing devices are not justified by fuel savings, furnace design and method of firing must be given consideration. As this subject is somewhat involved, reference to the Bureau of Mines publication "Hand Firing Soft Coal Under Power Boilers" is recommended to those interested in smoke prevention.—S. H. COLEMAN, *Roanoke, Va.*



Method of constructing grout box and applying it when mending leaks in fitting with cement.

Cement Seals Leaks In Suction Lines

When a break occurs in a suction pipeline, as a result of its being cramped, twisted (or for any other reason), the fitting involved is likely to spring a leak and to remain a leaker, unless something definite is done to seal it.

Because of the fact that the suction on the line causes an inward flow of air, it is possible to apply cement to the fitting. The suction in the pipe will then draw this cement into the cracks or other leak channels that are present. The suction pump must be kept going on the line while this is being done.

A method of applying this cement to an ordinary coupling in such manner that the fitting is entirely submerged in the cement, is shown in the accompanying sketches. A small grout box is made so that it will fit up against the pipe and embrace it as shown and at the same time two slide gates are slid down into the ends of the grout box behind cleats. This allows the pipe and fitting to be entirely submerged in a wet cement slop or grout, without it getting out of the box. Agitate the grout with a small paddle or stick for a few moments. Then shut off the pump and allow a moderate amount of time for the cement to set. The process can be repeated if testing shows more cement to be needed.

To repair a leak in an elbow, tee, valve, or other fitting, the same procedure is followed, only the grout box is modified in construction to accommodate the part being repaired.—JOHN E. HYLER, *Peoria, Ill.*

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Time Schedule Clock

A DEVICE that will remind an operator of as many as 48 duties or operations over a 12-hour period is being marketed by Remind-O-Clock Corp., 111 Sutter St., San Francisco, Calif. This clock can be set to sound a buzzer at any number of desired times and also to switch on a red alarm light. It is fitted with connection for electrical appliances, so that it can be used to turn equipment on or off automatically, according to a predetermined time cycle.

Time schedule clock

Floor and Tread Material

A NON-SLIP MATERIAL for floors and stair treads is being manufactured by American Brake Shoe & Foundry Co., 230 Park Ave., New York, N. Y. It is made by applying electric furnace abrasive grains to cast iron, bronze, aluminum or nickel silver, by a special process of casting which bonds the grains uniformly to the metal. This material is highly resistent to corrosion and its non-slip properties are unaffected by water, oil or other slippery liquids.

Quick Freezing Unit

POULTRY FREEZING units for New York dressed poultry have been standardized by Z Pack Corp., Chas. H. Welling & Co., Inc., 420 Lexington Ave., New York, N. Y. One of the models is designed to handle 400 fowl per hour. It is a three tier machine, with overall length of 34 ft., width of 4 ft., and height of 7 ft. The average freezing time is 1½ hours, the equipment being suitable for a size range all the way from broilers to turkeys.

This machine is an insulated tunnel through which boxes of poultry move on conveyors on three different levels at a predetermined speed. The operation is automatic. Machines of larger or smaller capacities are obtained by building the unit longer or shorter, all the other elements remaining the same.

Rectangular Tin Labeler

PNEUMATIC SCALE CORP., LTD., Norfolk Downs, Quincy, Mass., has developed a high-speed automatic labeler for use with rectangular spice tins and canisters, or similar containers. This machine will label plain tins automatically and efficiently after the filling operation, enabling the manufacturer to avoid the use of lithographed or pre-labeled tins.

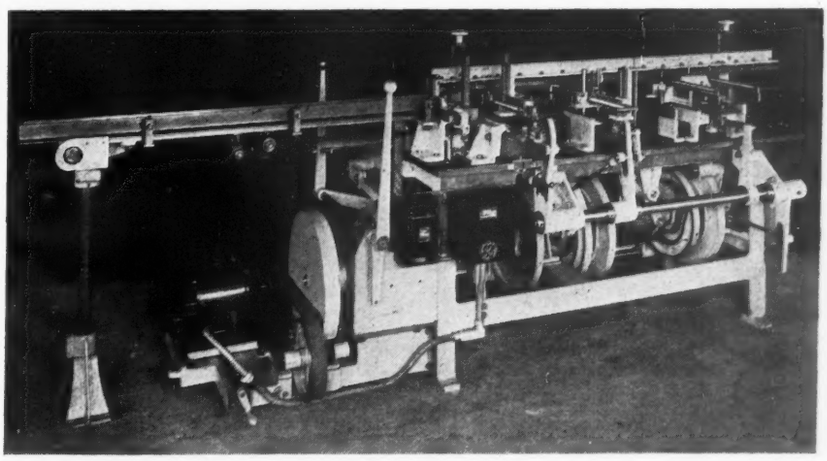
The labeler can be adjusted to accommodate a different size of container in less than twenty minutes. Its capacity is over 60 cans per minute.

Package Heat-Sealing Plates

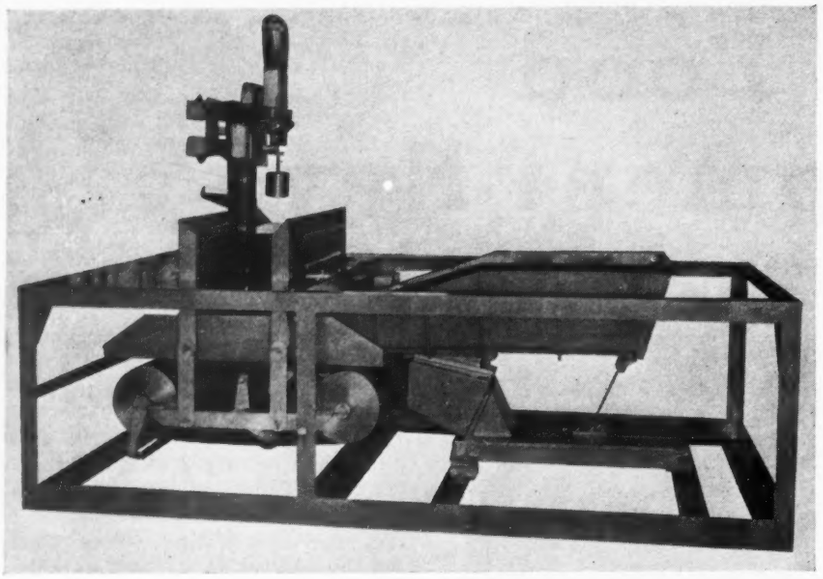
HEAVY DUTY SEAL-PLATES in three styles, for sealing packages wrapped in heat-sealing cellulose sheet, wax paper and other materials that can be sealed in this manner, have been placed on the market by Oliver Machinery Co., Grand Rapids, Mich.

These seal-plates have cast iron tops, and in other ways are designed for heavy duty performance. One style is a single plate of portable design, for resting on a table or counter. This may be used singly, or built together in groups. Another design is a single plate for flush mounting in the top of a counter or table. The third type is called the "slide" type and has inclined plates for approach and off take.

Heavy duty seal-plate of the "slide" type.



Automatic labeler for filled, rectangular tins.



Continuous weigh feeder for dry, bulk materials.

Continuous Weigh Feeder

AN AUTOMATIC, continuous weigh feeder for providing a steady flow of dry-bulk materials by weight per hour has been developed by Syntron Co., Homer City, Pa. It is available in sizes having capacities from 25 lb. to 25 tons per hour. It is made up of a vibratory feeder conveyor discharging onto a constant speed belt conveyor suspended from a scale having sensitive electric valves. A constant load, by weight, is maintained on the belt conveyor by the speeding up or slowing down of the discharge of the vibratory feeder, which is controlled by the electric valves. These valves function on slight under-weight or over-weight movement of a scale beam.

The scale functions purely as a scale, exerting no mechanical power to operate its electric control valves. The vibratory feeder is of the pulsating, electro-magnet type.

Paint for Wet Surfaces

WET-X-HALE PAINT COMPOUND CO., 15 Moore St., New York, N. Y., is manufacturing a paint that can be directly applied to surfaces wet with rain, fog, dew or condensate, whether inside or outside. When the paint is applied, ingredients which it contains absorb all the moisture that was on the painted surface. With the absorbed water, these ingredients then come to the outer surface of the paint film and there evaporate, taking the water away at the same time. This action is said to occur with no peeling or blistering of the paint. When set and dry, the paint film then resists the penetration of water. It is also said that this paint, by its action, protects iron and steel surfaces from rust.

Scale Trucks

HAND LIFT FACTORY TRUCKS equipped with scales are being produced by Barrett-Cravens Co., 3255 W. 30th St., Chicago, Ill. These are available in three capacities: A light duty, 2,500 lb. capacity scale truck equipped with a dial scale; and 3,500 lb. and 5,000 lb. trucks with beam scales.

Scale truck

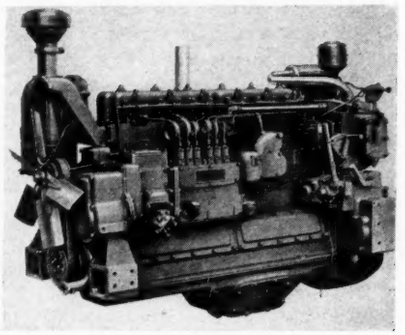
Process Timer

ZENITH ELECTRIC CO., 607 So. Dearborn St., Chicago, Ill., has brought out a timer that has one large 24-hour dial and a 1-hour dial cam. Two pointers connected with an electrical contact arm ride each dial. Segments are cut in the 24-hour dial at the periods when signal is to operate. The 1-hour dial cam has slots at each 15-minute period. At each 15-minute period, one pointer drops into a slot on the 1-hour dial, but cannot make a contact until the preset time is reached on both dials. Then both pointers drop at the same moment, ringing the signal for a predetermined time.

Four types are offered. Type P-24 has time periods set at the factory and signal operates for 5 seconds, or as predetermined. Type P-524 is similar, except that time periods can be set or changed at any time. Type P-24A is like P-24, except that the operating period is adjustable from 1 to 15 seconds. Type P-524A is similar to type P-524, but has adjustable operating period from 1 to 15 seconds.

Diesel Engine

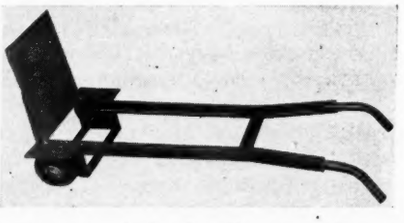
CATERPILLAR TRACTOR CO., Peoria, Ill., has added to its line a six-cylinder, 66-hp. industrial diesel engine, Model D-4600. This engine is designed for use in driving industrial equipment or for connection to a generator. It can carry a sustained load of 50 hp.



Diesel engine of 66 hp. maximum capacity.

Scoop Truck

FOR HANDLING any type of container, including crates, boxes, cases, or barrels, Barrett-Cravens Co., 3255 W. Thirtieth St., Chicago, Ill., has developed the Scoop truck. This is designed so that the load comes directly on the wheels and axle, not on the truck operator's arms. It is of welded steel construction, 19¼ in. wide and 53 in. high. Wheel diameter is 6 in. Hyatt roller bearings are used.



Scoop truck for handling containers.

Just Off The Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

CONVEYING EQUIPMENT—All types of conveyors for the dairy industry—roller, chain, vertical lift and special types—are covered in an 8-page bulletin published by Standard Conveyor Co., North St. Paul, Minn.

CORROSION RESISTANT EQUIPMENT—General Bulletin O-1 of the Haveg Corp., Newark, Del., is a catalog of processing equipment giving descriptions, applications, specifications and resistant properties of Haveg 41 and Haveg 43.

DAIRY PRODUCTS EQUIPMENT—American Machine Co., 414 Walbridge St., Kalamazoo, Mich., has issued bulletins describing dry milk machines and the "Sheldon" freezer for ice cream.

GRINDING—Jabez Burns & Sons, Inc., 11th Ave. and 43d St., New York, N. Y., have issued the Series 25 and the No. 26 Burns Granulator Bulletin showing equipment for grinding and merchandising coffee.

MEAT PACKING EQUIPMENT—Highlights of "Boss" developments dealing with the latest improvements in cutting, grinding and stuffing operations are illustrated in reprints of recent advertisements published by The Cincinnati Butchers' Supply Corp., 1972 Central Ave., Cincinnati, Ohio.

PROCESSING EQUIPMENT—The Combustion Engineering Co., Inc., 200 Madison Ave., New York, N. Y., has published an 8-page illustrated catalog of pressure vessels and fabricated plate work such as bubble towers, auto-claves, cylinders, flash towers, digesters, tanks.

Plant Accessories and Supplies

ELECTRIC MOTORS—In two new bulletins, one entitled "Streamline Protection" and the other entitled "Asbestos Protected," U. S. Electric Motors, Inc., Los Angeles, Calif., describe some of the features of the inclosed motors which it builds.

ELECTRIC MOTORS—"Polyspeed" variable speed alternating current electric motors are announced by Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., in Bulletin No. 251.

FEEDWATER TREATMENT—In a new 12-page bulletin, American K.A.T. Corporation, 122 East 42nd St., New York City, describes its compound for the treatment of boiler water.

FILTER AID—"Dicalite" filter aid of diatomaceous silica is described and specified in a bulletin entitled "Dicalite Aids to Industry," published by The Dicalite Co., 120 Wall St., New York, N. Y.

INDUSTRIAL ELECTRIC TRUCKS—Elwell-Parker Electric Co., Cleveland, Ohio, has issued a pocket-sized booklet of 32 pages illustrating various types and models of factory trucks, tractors and cranes.

LUBRICATION—E. P. Houghton & Co., Third, America and Somerset Sts., Philadelphia, Pa., has issued a reprint of an article entitled "Lubrication in the presence of moisture," telling how to deal with this difficult industrial problem.

PAINT MAINTENANCE — Wailes, Dove-Hermiston Corp., 17 Battery Place, New York, N. Y., has issued "Bitumastic Visual Index," a chart for checking up on the paint maintenance of the industrial plant.

PUMPING EQUIPMENT—Self-priming centrifugal pumps, designed for handling 600 to 20,000 gal. of water per hour, are discussed in Bulletin No. 3000 by the Deming Co., Salem, Ohio.

PUMPS — Deep well centrifugal pumps, of the submersible motor-driven type for industrial service are described by American Marsh Pump, Inc., Battle Creek, Mich., in a 4-page bulletin, No. 265.

SPEED REDUCERS—In Catalog No. 68, the Stephens-Adamson Mfg. Co., Aurora, Ill., describes its JFS variable speed reducer transmission and shows applications of this device.

STEAM TRAPS—In Bulletin T-1733, Yarnall-Waring Company, Chestnut Hill, Philadelphia, Pa., discusses the design and application of its impulse steam traps.

UNIT COOLERS—Bulletin 70, Niagara Blower Co., 6 East 45th St., New York City, describes the "dual" cooler which is used both for cooling milk after it leaves the pasteurizer and for holding the bottled milk storage room at correct temperature.

Trucks, Tractors and Accessories

DAIRY TRUCKS—"Serving the Dairy Industry" is the title of a folder published by the General Motors Truck & Coach Division, Pontiac, Mich., describing equipment for hauling and delivering dairy products.

REFRIGERATED TRUCK BODIES—Four types of refrigerated bodies for truck delivery service, including automatic frigeration bodies, automatic with partial hold-over, hold-over electric refrigeration, and hold-over ammonia refrigeration, are described by General Electric Co., Schenectady, N. Y. in Bulletin GES-1547A.

TRUCK INSULATION — "LK" corkboard for insulation of all types of truck bodies is the subject of a folder issued by Armstrong Cork Products Co., Lancaster, Penn.

TRUCK TRANSPORTATION — Four-wheel-drive trucks for highway work in the heavy duty trucking field are described in a booklet, "FWD Trucks for Multi-Purpose Duty," by The Four Wheel Drive Auto Co., Clintonville, Wis.

Control Equipment

CONTROL INSTRUMENTS—The Celectray pyrometers of the high speed photoelectric type, for use in control of baking and other ovens and furnaces, are described in Catalog No. 1101D by C. J. Tagliabue Mfg. Co., Park & Nostrand Aves., Brooklyn, N. Y.

INSTRUMENT BOARDS — Standard practice in control board design is described in Bulletin No. 222, 22-page illustrated publication of The Foxboro Co., Foxboro, Mass.

REMOTE CONTROL INSTRUMENTS — Photographs and chart records illustrate Bristol's Metameter system for telemetering and remote automatic control in Bulletin No. 506, Bristol Co., Waterbury, Conn.

Materials of Construction

MATERIAL FOR EQUIPMENT CONSTRUCTION—"Worth Looking Into—A Record of Material Facts From Food Plants" is the title of a 24-page illustrated bulletin published by The International Nickel Co., Inc., 67 Wall St., New York, N. Y., dealing with the use of Monel, nickel and Inconel metals.

New DISCOVERIES AND INVENTIONS

FOOD ENGINEERING

To Get Sterile Re-Use Containers

WASHING OF RE-USE CONTAINERS involves the dual problem of getting them clean and sterilizing them. Hard waters aggravate the problem because of the formation of a film of calcium and magnesium soaps. These, however, can be prevented from forming by the use of suitable chemicals in the wash water. These chemicals convert the calcium and magnesium into soluble, but non-ionizable, compounds, thus "sequestering" them. They simply will not precipitate. Such chemicals are sodium metaphosphate, sodium metasilicate and related substances. They greatly aid the cleaning operation, but the problem of sterility still remains unanswered. Should a sterilizing chemical such as sodium hypochlorite be used at the same time?

This investigation indicates that the use of such an auxilliary germicide is open to question as long as an alkaline detergent having film-preventing properties is used. A proper detergent alone is as good a germ remover as the detergent plus germicide.

Digest from "Sanitary Value of Sodium Metaphosphate in Dishwashing." By Hall and Schwartz, Industrial and Engineering Chemistry, 30, 23, 1938.

Electrolysis as a Tool In Sugar Refining

IMPURITIES in cane juice or molasses can be effectively removed by electrical precipitation, as disclosed in Austrian Patent 152,309 (granted Jan. 25, 1938, to Hugo Wertheim, "Elact" Gesellschaft für Elektrische Apparate G.m.b.H., Vienna). The apparatus for this purification process comprises an anode cell, enclosed within a diaphragm and filled with a solution of a neutral salt, and a cathode cell, also enclosed within a diaphragm and filled with an alkaline solution. The neutral salt in the anode cell may be a salt of aluminum or magnesium, or of one of the alkaline earths. When the electric current passes through this set-up, the impurities in the juice or sugar solution are separated from the solution as a flocculent precipitate which is easily removed from the liquid, by filtration or other suitable method. The liquid is then perfectly clear and in excellent condition for its subsequent use, whether as molasses or in the production of sugar from cane juice.

How to Sterilize Pipe Lines and Rubber Hose

TO STERILIZE PIPE LINES, at regular intervals the pipe is filled with hot soda (Na_2CO_3) or caustic (NaOH) solution, then flushed out with disinfectants or steam.

For rubber hose the treatment must be different because of the rough interior surface. The foregoing treatment will still leave as many as 1,000 organisms per cubic centimeter of sterile wash water. Reason: a tight film deposits on the inside of the hose which must be removed mechanically.

Recommended procedure is first to soak in caustic soda, then "rod out" the hose with a rod on which metal disks covered with heavy filter cloth are fastened. Heavy leather disks may also be used. "Rod out" the hose three or four times a year to prolong its usefulness.

Digest from *Böhmische Bierbrauer*, 64, 305, 1937 (Published in Czeckoslovakia).

DEHYDRATED FOODS

Puffed, Crystallized Fruit

DRYING OF APPLES, bananas, peaches, grapes and similar fruits to contribute a puffed or the well-rounded appearance of their fresh state but with a dry, porous, crisp, crystalline structure is described in U.S. Patent No. 2,110,-184 granted to Wells A. Webb, Wilmington, Calif., and assigned to Dry Fruit Products Co., Oakland, Calif.

These properties are obtained by heating the fruits in a 300 to 320-deg. F. drying chamber carrying a vacuum of about 29.5 in. of mercury. During the first 20 to 30 minutes the removal of water vapor is at a rapid rate and the fruit reaches a temperature of 180 to 200 deg. F. After this preliminary drying step, the valve in the vacuum line is closed and steam or other gas or vapor is admitted to give a chamber-pressure of 30 to 45 lb. per sq.in. for 1 to 3 minutes. Upon opening the valve in the vacuum line, the 29.5-in. vacuum condition is again reached in about 1 minute which gives the fruit its puffed or swelled form. Kept under the constant reduced pressure at 180 to 190 deg. F., a dry, crisp, crystalline state is reached in from ½ to 1 hour, depending upon the fruit being dried.

Ripe banana slices show beautifully laced patterns of fine red lines across their faces when the pressure treatment is continued for 2 or 3 min. at 35 lb. per sq.in.

Very little decomposition of the fruit sugars take place under these processing conditions.

METHODS OF PRESERVATION

Ozonizing Foodstuffs

PERISHABLE FOODS can be kept fresh over commercially useful periods of time by treatment with ozone to destroy molds and other micro-organisms which cause spoilage. The treatment must be carefully controlled, however, and judiciously applied because ozone owes its powerful disinfecting action to its remarkable oxidation activity. Since oxidation is itself an undesirable reaction in many food products, the ozonization treatment must be confined to actual danger points and, as nearly as possible, must be prevented from exerting its action on the food material. Maximum sensitivity of the micro-organisms and minimum sensitivity of the food product are therefore important considerations.

On this basis, meat preservation is a field in which ozone can be successfully employed. A preliminary treatment reduces the bacterial count about 95 per cent and approximately doubles the life of fresh meat, but still spoilage has been postponed only a few days. For prolonged cold storage of fresh meat, repeated mild ozonization is effective, for example twice daily

(two hours each time) at about half the ozone concentration employed for a 95 per cent reduction of the bacterial count. Meat can be stored two months or longer under these conditions. Excepting for a bleaching effect which may occur if more ozone than necessary is used, the oxidizing action of the very small quantity of ozone does not impair the quality of the meat.

Eggs can be stored from the laying to the non-laying season if properly protected by ozone treatment. Fruits vary a great deal in their sensitivity, bananas being definitely harmed by effective ozone concentrations, whereas oranges are quite unaffected. Apples are intermediate in sensitivity.

Digest from "Keeping Perishable Foods Fresh by Ozonization," by G. Kaess, *Chemiker-Zeitung* 62, 365, 1938. (Published in Germany.)

RAW PRODUCE

Rust on Celery

RUST SPOTS ON CELERY, cause of much loss to growers and marketers because of the unsightly appearance, can now be explained and, in some degree, prevented. A searching investigation at the Institute for Plant Nutrition and Soil Biology in Berlin has revealed that the rust spots are caused by resin formation when the essential oil of celery is exposed to air and enzyme action. As an oxidation effect, the discloration depends on the temperature and on the alkalinity of the water in which the celery is kept before cooking. Thus, heat accelerates the effect until the temperature reaches 87 deg. C. (168 deg. F.), beyond which the stain does not appear. This shows the enzyme influence, heat having inactivated the enzyme above the specified temperature.

Similarly, cooling below 4 deg. C. (39 deg. F.) inactivates the enzyme and prevents rust. But in this case the effect is reversible because the enzyme is not destroyed, as by heat, but is merely prevented from functioning. The enzyme is a peroxidase, as proved by the instantaneous appearance of the brown color when guaiacol hydrogen peroxide is applied to celery. In preparing canned celery, the preferred method of preventing rust is to cut the celery under ice water and then transfer it immediately to the boiling water.

Digest from "Causes of Rust on Celery and Its Prevention in Canning," by F. Giesecke and W. Schuphan, *Zeitschrift für Untersuchung der Lebensmittel* 75, 157, 1938. (Published in Germany.)

Apple Storage, Too Cold

COLD STORAGE of apples in the past has been at too low a temperature and has been the cause of soggy break-down (also known as soft scald). The most effective remedy is to store the apples at 35–36 deg. F. instead of at the conventional 31–32 deg. F. Long delays before putting susceptible apples into storage also helps avoid soggy break-down. From five to ten weeks at 50 deg. F. is suggested. Circulation of storage room atmosphere is of no help.

Digest from "Factors Influencing the Development of Soggy Break-Down in Apples," by Plagge and Maney. *Journal of Agricultural Research*, 55, 739, 1937.

BEVERAGES

Inorganic Substances in Beer

THE INORGANIC SUBSTANCES occurring in beer have always been left to the control of more or less accidental circumstances, but in this era of public health education and systematic diet there is good reason for regulating both the amount and kind of inorganic matter. If beer is to take and hold a high rank among beverages in the matter of food value, its inorganic nutrients should be known and controlled, with enrichment in desirable elements whenever a beneficial result can be economically obtained thereby.

The old idea that minerals in food products were important simply as structural elements (calcium and phosphorus for bones, iron for blood, etc.) has been dispelled by discoveries which reveal various salts as activators of enzymes and accessory food factors with other special functions. As a good product for the mass of people, beer, therefore, needs skilled attention and careful control.

The salts naturally occurring in beer vary with the water supply and with other factors, but the old custom of leaving the finer details of composition to chance should be abandoned in favor of artificial enrichment where analysis reveals a deficiency. As specific examples, calcium chloride in minute traces activates amylase, and might well be accorded a place in the list of nutrient salts, while the mineral constituents of blood serum are important to cellular activity and to healing of lesions. To serve as a source of such minerals is a proper function of beer as a beverage.

Digest from "Inorganic Nutrients and the Composition of Beer," by S. S. Ussolzew. *Chimie et Industrie* 39, Special No., Part II, 939C, 1938 (Published in France).

BAKERY PRODUCTS

Biochemistry of Bread

SUCCESSFUL BAKING of bread depends in large measure on enzyme actions, chief of which are the amylolytic and proteolytic effects. Amylolytic enzymes, by converting starch to sugars, govern the leavening effect of yeast while proteolytic enzymes decompose gluten and other proteins, thus governing the physical and chemical behavior of gluten and hence the consistency of the dough. Laboratory tests have confirmed the idea that as the gluten is decomposed to yield gliadin there is an optimum ratio of gliadin to gluten corresponding to the optimum physical properties of the dough. This opens up important possibilities for controlling quality, whether by blending different flours, by adding special ingredients or by controlling yeast action in the dough to attain the optimum gliadin: gluten ratio.

When the enzyme action is too fast it can be retarded by adding a physiologically permissible oxidizing agent, for example a bromate. If the action is too slow it can be speeded up by adding papain. Very little of these agents will suffice since 0.05 per cent papain, or less than 0.01 per cent bromate, will give a noticeable effect. Recent researches along this line have served to emphasize the importance of protein decomposition in bread making. In the past this problem has received relatively less attention than the starch-to-sugar conversion, which is also important but is better understood than the protein action.

Digest from "Biochemical Problems and Studies in the Technology of Baking," by U. Pratolongo. *Chimicale l'Industria* 20, 129, 1938. (Published in Italy.)

CANNED FOODS

Food Value in Canned Foods

OBJECTIONS to traces of metal in foods canned in aluminum or in tinplate are unfounded. Can contents do take up minute quantities of metal, but with no risk of any harm. If desired, even the small amount of metal absorption which does occur can be prevented by coating the inside of the cans with a baking varnish, which must be resistant to sulphur.

The effect of sterilization on quality in canned foods is another problem. Sterilization does not affect carbohydrates (sugars and starches) or fats, but proteins are coagulated at

sterilizing temperatures and due allowance must be made for this.

The valuable mineral content of food products not only is not harmed by the canning process, but actually is converted to a more readily available form than in the fresh material.

The various vitamins differ a great deal in their sensitivity to canning conditions, ranging from complete destruction (if unguarded) to practically perfect immunity. Thus, vitamin A is sensitive to oxidation at cooking temperatures and must be protected from air or oxygen if it is to be retained. Vitamin D, on the other hand, suffers no serious loss of potency and so is fully available in canned foods. Vitamin C is more sensitive, but suffers only a moderate loss. Investigations concerning the resistance of vitamin B_1 to canning have not yet reached a definite conclusion, but it is known that canned foods retain at least part of their original vitamin B_1 potency.

Digest from "Food Value of Vitamin Content of Canned Foods," by Gulbrand Lunde, *Teknisk Tidskrift* 68, 134, 1938. (Published in Sweden.)

CEREAL PRODUCTS

Quicker Curing of Rice

A STUDY OF RELATIONS between the physico-chemical properties of rice and its quality revealed important changes in properties during storage of freshly harvested unhulled rice. In the endosperm, the amylose undergoes a chemical condensation reaction with loss of water. Cross-linkages are formed between large molecules and the rice kernel takes on a more definite structure, in which the proteins and lipids as well as the starch molecules participate. There is some practical importance in the observation that formation of cross-linkages can be artificially accelerated, because the time required for curing rice is thereby shortened.

Cured rice is structurally a colloidal system intermediate between the lyogel and xerogel states. Upon exposure to moisture, hydration occurs with liberation of heat if the temperature is below 40 deg. C. (104 deg. F.), but tending more and more to absorb heat at higher temperatures. Hydration, whether with liberation or absorption of heat, causes marked swelling. This means partial breakdown of the cross-linkages. It was found that swelling offers the best measure of quality. For this reason a convenient quantitative method for determination of swelling has been worked out.

Digest from "Physico-Chemical Investigations on Rice," by S. R. Basrur, Communications, Tenth International Congress of Chemistry, *Chimica e l'Industria* 20, 330, 1938 (Published in Italy).

DAIRY PRODUCTS

Pasteurizing Milk

A NEW pasteurization procedure, which has the special merit of not imparting any "pasteurized" taste to the milk, is disclosed in British Patent 482,759 (granted May 5, 1938, to R. J. Wightman, Chicago, Ill., assignor to Cherry-Burrell Corp.). Another advantage of the new method is that there is no creaming of the milk. The sequence of operations is this: First warm the cold milk in 2 minutes to 36 deg. C. (96.8 deg. F.), then in 1 minute to 70 deg. C. (158 deg. F.). Hold at this temperature at least 2 seconds but not more than 4 minutes, then cool rapidly to a temperature below 62 deg. C. (143.6 deg. F.) and heat again, in 60 to 90 seconds, to 72 deg. C. (161.6 deg. F.). Hold at this temperature 15 seconds, then cool to about 5 deg. C. (41 deg. F.).

Keeping Qualities of Cold Storage Butter

WHEN BUTTER IS STORED at −13 deg. F. there is an immediate decrease in bacterial count after one day's storage and a further decrease after 90 days. Salt seems to protect bacteria, for the decrease is greater with unsalted butter than with salted. The flavor does not change.

Unsalted butter held at room temperature (70 deg. F.) for seven days shows more bacterial growth and off-flavors in storage butter than in fresh. Salted butter showed no significant change in bacteria count or flavor (except for tallowiness). Fat and protein splitting bacteria were found in the unsalted butter but their numbers did not correspond with the off-flavor produced.

Digest from "Bacterial Content and Keeping Quality of Butter after Removal from Storage," by D. H. Jacobsen, *Journal of Dairy Science*, 21, 187, 1938.

FISHERY PRODUCTS

Whale Meat Extract

ONE OF THE PRINCIPAL DRAWBACKS of whaling as an enterprise is that only 20 per cent of the whale is utilized. In the operations of the new German whaling industry it is proposed to use the meat as well as the blubber, and to give attention to other products as well. Whale meat has never enjoyed a good reputation, but has been generally rejected as being unattractive in appearance and nauseating in flavor. The foregoing complaints are not necessarily correct and there have been many suggested expedients for making an attractive edible product from the meat.

Refrigeration, brine pickling, extraction and drying have been proposed, Some success has been achieved by the last two methods, so that whale meat extract and meal can be produced in fully acceptable form and flavor. The extract is made by comminuting the meat in the cold, heating as quickly to 80 deg. C. (176 deg. F.) or covering with hot water at 90 deg. C. (194 deg. F.) and separating the solution from the residue of meat and oil. This removes the small amount of residual protein by coagulation and takes with it the disagreeable odor and flavor. The extract is concentrated by evaporation, in vacuum if desired. It has a pure, not salty, taste and very closely resembles Liebig's beef extract. Whale meat meal can be made by heating only moderately in water to coagulate the protein and cause it to give up its water of hydration, then pressing and drying in vacuum. By this method the sensitive protein is retained unharmed.

Digest from "Utilizing Whale Meat," by H. Schmalfuss and H. Werner, *Fette und Seifen*, 45, 60, 1938. (Published in Germany.)

SUGAR

Ash in Sugar

THE ORIGIN of ash in sugar has been studied, and changes occurring during refining have been followed, to ascertain the relations at different refining stages. The ash content of intermediate products is governed by that of the raw material, since only a very small proportion of the total ash is formed after refining begins. Of the ash contained in massecuite, about 1.36 per cent remains in the sugar after centrifuging. The main portion goes into the residue, in which the ash content becomes higher as purity becomes less. To the extent to which the expense is justified by improved quality, the ash content of refined white sugar can be lowered by suitable precautions in refining. Analysis of intermediate and final products shows that there are definite relations between ash content, apparent purity and sucrose purity. From these a relation

(*Turn to page 595*)

General News—Business Trends—Men, Jobs and Companies

Food Industry Problems Discussed By Chemists at Milwaukee Meeting

Technical and economic information bearing on problems of the food industries was contained in papers presented at the annual meeting of American Chemical Society in Milwaukee last month. Below are highlights abstracted from some of these papers.

Fats and Oils

Rapid shifts in finished products and in technics are increasing demands for different raw materials. Improved materials of construction and better ways of working under reduced pressures aid better use of available fatty raw materials, more thorough separation of the various fats and newer fat combinations that may be made.

The future indications are: (1) a continued shifting of use of animal, vegetable and marine oils according to available supplies; (2) a slight decrease in domestic production of animal fats; (3) an increase in attempts to develop a substitute for coconut oil; (4) an increase in use of fatty acids as raw materials; (5) an increase in competition from petroleum and cellulose derivatives; and (6) an improvement in the processing of available fat and oil supplies to lessen refining losses, to produce purer oils and to supply glycerides more suitable for particular uses.

Improved methods of refining crude fats are lessening the quantities of edible fats degenerated into inferior grades. Glycerides which are now used by the soap, paint, linoleum and tinplate-making industries can be refined for edible use.—ARTHUR GUILLAUDEU, *Swift & Co., Chicago, Ill.*

Role of Sugar in Meat Curing

The general belief has been that sugar in the "sugar cure" for meats is added solely for flavor improvement. But results of recent researches show that it has a color effect as well. In the presence of certain acid-producing micro-organisms, sugar makes possible the production of acid, oxidative products which serve as protective or intensifying agents for the heat-resistant red pigment, nitroso-haemoglobin, formed by nitrite in "curing salts."

Absence or a deficiency of added sugar permits oxidation of the nitroso-haemoglobin to an appearance-detracting brown pigment. Color effect of added sucrose is reached between ten to fifteen days of the curing period when it has been inverted to form dextrose which is present at the end of the curing period. In some instances the use of dextrose instead of sucrose brings about the desired color effect in a shorter curing period because there is a quicker action by the micro-organisms.

Use of a spectrophotometer made possible the quantitative measurement of the pigment color changes.—D. A. GREENWOOD, *et al., Institute of American Meat Packers, Chicago, Ill.*

Frozen Bread

Freezing of bread for the retardation of staling gives two-fold results. Staling is retarded if low enough temperatures are used but in all cases there is the development of an "off aroma" which as yet has not been accounted for.

From the standpoint of chemical and physical tests –11 deg. C. is as effective as –22 deg. C. for the first three days of elapsed time. However, by these tests the bread was about half stale when placed in the freezers after 8 hours out of the oven and fully stale at the end of the test, 4 hours being required for thawing. At –35 deg. C., the bread retained its original half-stale condition for a longer period becoming fully stale after about ten days. If kept at –35 deg. C. for 60 to 70 days the bread recovered to its original half-stale condition.

At all temperatures used, chemical and physical tests showed the bread to be stale before staleness was detected by smell and taste.

Development of staling in frozen bread that has been thawed proceeds at approximately the same rate as in unfrozen bread. Freezing in an atmosphere of CO_2 gas at –22 deg. C. gives no advantage over bread which is frozen at the same temperature in normal air.

The freezing was done in large commercial freezers in still air — under "sharp freezing" conditions—with the bread wrapped in commercial waxed paper to prevent condensation of moisture on the crust during the freezing and thawing.—WILLIAM H. CATHCART, *et al, American Institute of Baking, Chicago, Ill.*

New Data on Pectin

Grade of pectin and true viscosity of its solutions are functions of the molecular chain length. Setting time and effect of salts are functions of the combining weight of pectin. As pectins

CONVENTIONS

OCTOBER

2 (week of)—Master Brewers Association of America, Hotel Statler, Buffalo.
6–8—Convention and exhibition of the fishing industry, sponsored by Fishing Industry of New England, Hotel Statler, Boston.
9–14—American Dietetic Association, Milwaukee, Wis.
10–14—National Safety Council Silver Jubilee Congress, Stevens Hotel, Chicago.
17 (week of)—American Bakers Association, Hotel Sherman, Chicago.
17–19—International Association of Milk Dealers, Hotel Statler, Cleveland.
17–22—Dairy Industries Exposition, Public Auditorium, Cleveland.
20–22—International Association of Ice Cream Manufacturers, Cleveland.
20–21—Food Preservation Conference, School of Engineering, University of Tennessee, Knoxville.
21–25—Institute of American Meat Packers, Drake Hotel, Chicago.
24 (two weeks)—Sixth triennial meeting of International Society of Sugarcane Technologists, New Orleans and Baton Rouge, La.
30–Nov. 1—New England Bakers Association, fall meeting, New Haven, Conn.
31–Nov. 4—American Bottlers of Carbonated Beverages, Commerce Hall, Port of New York Authority Bldg., New York.

NOVEMBER

2– 4—Association of Pacific Fisheries, Hotel Del Monte, Del Monte, Calif.
14–16—National Cooperative Milk Producers Federation, Netherlands-Plaza Hotel, Cincinnati.
28–30—Associated Grocery Manufacturers of America, Waldorf-Astoria, New York.

undergo progressive demethylation the combining weight decreases proportionally and the setting time increases to a maximum in the range of combining weight of 550-575. If demethylation proceeds beyond this range, the setting time is again rapidly decreased.

Pectins of low combining weight show abnormal viscosities within certain pH ranges and in the presence of salts. The so-called optimum pH for jellies is a fictitious value useful only when considered in connection with narrowly limited conditions of jelly making.—AKSEL G. OLSEN, *et al, General Foods Research Laboratories.*

Ripe Olive Curing

Between applications of several successive solutions of NaOH, ranging in concentration from about 1.5 to 0.5 per cent NaOH, brine-treated ripe olives are exposed to the air to develop a dark color preparatory to canning.

During the two to more months of storage in the 20 to 35-deg. (salometer) brine the olives take on a moderate increase in oil content; probably from conversion of oleanol or mannite to oil. However, during the lye treatment, in most cases, there is a decrease in oil content, a great decrease in water soluble solids, a marked increase in pH value, a slight decrease in alcohol precipitable matter, a slight decrease in total protein and a very marked decrease in total sugars, mannite, tannin, coloring matter and total acid.—W. V. CRUESS, *et al, University of California.*

To Train Technologists For Food Industries

Realizing the need in the food industries for men trained as food technologists rather than as specialists in a particular branch, University of Washington has introduced a four-year course in food technology. This course provides training for students who intend to enter the field of food production as control or research laboratory workers. Emphasis may be placed upon bacteriology, chemistry or food utilization by the selection of various optional courses in the fourth year.

The curriculum in food technology is administered by a committee from the departments of bacteriology, chemistry and home economics.

Birds Eye Increases Frosted Food Output

Production of quick frozen foods is being stepped up greatly by Frosted Foods Sales Corp., New York, packers of Birds Eye brand. Three things done by the company will bring about the increase. A shrimp freezing plant has been opened at Jacksonville, Fla. Meat packing operations at Boston have been expanded to obtain larger production of quick-frozen beef, lamb and pork products. And a record harvest (12,000 acres) of lima beans for quick freezing was made at Seabrook Farms, near Bridgeton, N. J.

In addition to these developments, Frosted Food Corp. is increasing greatly the freezing of fish and lobster at the Boston Fish Pier, expanding both freezing and fishing facilities.

Added tonnage to supply a rapidly growing market for vegetables is being supplied by a new quick-freezing operation for peas and corn at Fairmount, Minn., and for Golden Bantam corn in New York State. Moreover, other vegetables and a full line of fruits are being packed in larger quantities at strategic points.

New Preserve Standards Now Being Developed

Early promulgation of new standards for the preserve industry is the intention of the Food & Drug Administration. It is the plan to establish definite chemical standards for all types of fruits used in preserves and to furnish a yardstick by which lay juries will be able to evaluate technical evidence in legal cases.

To set up such standards requires much factual material, and National Preservers Association representatives and men from the F&DA are working together on this. The preservers are pleased with the desire of government

CAPITAL VIEWS

FOOD GEOGRAPHY—Two striking problems affecting the geography of food processing have been noted lately in Washington, both with concern. Until recent years, ambitious agricultural folks moving westward have always found new opportunity for home making in the newer areas of this country. Now this westward movement of plainsmen is creating great problems in the Pacific Coast states, adding to the unemployment there. The major "out" being considered by economists is growing more commercial fruits and vegetables *for processing* because, obviously, home consumption of much larger fresh crops is out of the question.

In the deep South quite a different situation is discovered in a survey of the state of Alabama. There it is found that most of the commodities which must be shipped into Alabama are manufactured foods. Outstanding among these are wheat flour, canned foods, fresh meat, cured and smoked meat, other edible packing house products, syrups, eggs, dried fruit and corn. These commodities each represented net movements into Alabama of from one to twelve million dollars during 1937. The only other commodities imported in such quantity were newsprint paper and fertilizer. Both federal and state officials would like to see food processing develop in that state as a source of employment and better diet. Radical changes in food-industry geography would be involved, and can come but slowly.

WANTS VS. NEEDS—"A clear distinction ought to be made between what people want and what they need . . . In New York, it is probably true that milk can be laid down at distributing stations, like chain stores, for 7 cents a quart, but that, if it is delivered in bottles, the cost will be not less than 11 or 12 cents. People ought to want 7-cent milk and be prepared to go around the corner every morning to get it. They actually do want it put on the doorstep." Washington reformers have been rather shocked that one of their own number, Assistant Secretary of State Berle, should talk in this fashion.

NO FOOD LAW GAPS—Pending next June, when the full force of the new food law will take effect, old policies and practices are being continued by the Food & Drug Administration. But more rigid enforcement can be expected with respect to food, drug or cosmetic constituents of doubtful safety and those practices which merely "got by" under technicalities of the old law. However, it is not expected that companies making a sincere effort to cooperate with the F&DA will have any real difficulties because of this slightly increased zeal and authority.

QUALITY STANDARDS—The recent adoption of tentative standards for canned grapefruit juice is but one bit of evidence of the determined policy of the Department of Agriculture to encourage the classification and labeling of canned foods by A, B, C grades. Almost every month there is some new effort of Department specialists to stimulate the women's clubs, buying cooperatives or other groups to support this "cause."

PRICE FIXING—Since all other technics of agricultural control seem to have failed, many think that the Department of Agriculture will shortly embark on price fixing as the only remaining method which it can use to protect farmers against extremely low market prices for their goods. Export bonuses may be talked about now as if they were a permanent relief measure. But it seems more likely that they are merely a stop-gap until Congress can grant a little more definite authority for federal price fixing on wheat, corn, cotton and the other major products of agriculture. This may come disguised as crop loans or price guarantees, but the price fixing objective will be only thinly obscured.

WAGE-HOUR COOPERATION—Administrator Andrews is outspoken in his desire to cooperate with industry, as he seeks sincere and full compliance with minimum-wage and maximum-hour standards fixed by law. His early announcements have been almost unanimously approved by business representatives in the Capital as affording a workable basis for consideration of practical problems. Although initial industry committee activities are largely limited to textiles, cotton-goods garments and tobacco, there is no limitation on the effect of the law. Food manufacturers must plan to observe the 25-cent minimum and 44-hour maximum from Oct. 24. or else.

officials to work for fair and reasonable standards, based on authentic data gathered by both the government and the industry's association.

That proper information on which to base standards may be forthcoming, it is necessary for manufacturers to cooperate. They must at least advise NPA, for the Administration, when and where fruit is to be packed for use in preserves or jellies. Also, the manufacturer is being asked to smooth the path of all accredited agents of the F&DA who seek to be present when commercial batches of preserves are made from selected samples of fruit.

The data being gathered will enable both the association and the government to submit to the standards committee more specific and more easily enforced standards. In their present form, the standards read in terms of materials, rather than composition of the ultimate product. Because of their general terminology, the standards demand more scientific explanation than the average jury could digest. The standards at which NPA and F&DA are aiming would require little technical explanation in the trial of a case.

FOOD PRESERVATION CONFERENCE

University of Tennessee, Knoxville

THURSDAY, OCT. 20

10 a.m.—First Session

Address of welcome, Charles E. Ferris.
"Refrigeration—A Vital Factor in the Food Industry," David L. Fiske, executive secretary, ACRE.
"Refrigeration—a Boon to Farmers," C. J. Hurd, TVA Agricultural Engineering Division.

12:30 p.m.—Luncheon

Speaker, F. B. Ward, Economics Department, University of Tennessee.

2:30 p.m.—Second Session

"Bacteria—The Friends and Foes of the Food Industry," Dr. P. W. Allen, University of Tennessee.
"Behavior of Enzymes," Prof. G. A. Shuey, chemist, University of Tennessee.
"Effects of Freezing on the Vitamin Content of Vegetables," Gerald A. Fitzgerald, chief chemist, Birds Eye Laboratories.
"Control of Molds and Bacteria with Light," Dr. Harvey Rentschler, Westinghouse Lamp Division.

8:00 p.m.—Motion Pictures and Demonstrations

"Refrigerated Locker Plants" (with movie), A. A. Geiger, York Ice Machinery Corp.
"Glass Evaporator," Alco Valve Co.
"Frozen Foods" (movie), General Foods Corp.

FRIDAY, OCT. 21

9:00 a.m.—Third Session

"Quick Freezing Fruits and Berries," R. B. Taylor, University of Tennessee.
"Ice Crystal Formations in Frozen Foods," Dr. J. G. Woodroof, Georgia Experiment Station.
"Packaging Frozen Foods," R. M. Bergstein, Interstate Folding Box Co.
"Some Commercial Aspects of the Frozen Food Industry," Harry Carlton, University of Tennessee.

2:00 p.m.—Fourth Session

"Economics of Farmers' Locker Plants," W. E. Guest, consulting engineer.
"What is Ahead for the Frozen Food Industry in the Southeast," C. T. Baker, consulting engineer.

3:30 p.m.—Inspection Trip to Fulton Sylphon Co.

6:30 p.m.—Informal Dinner

Speaker, Dr. L. V. Burton, Editor, FOOD INDUSTRIES.

CORRECTION

In the Frozen Foods Cabinet Directory of the September issue of FOOD INDUSTRIES appeared the statement that Universal Cooler Corp. manufactures cabinets to specifications. This was in error. Universal Cooler Corp. builds no cabinets and does not plan building them. The company manufactures only cooling equipment.

The statistics given under the name of Universal Cooler Corp. pertain to cooling equipment manufactured by the corporation for cabinets not of its own manufacture.

Tests Heater for Cars

Tests by the Department of Agriculture indicate that the automatic gas heater has decided advantages over charcoal heaters for refrigerator cars carrying perishables cross-continent in winter, including uniform temperature and elimination of stops for inspection enroute. It is estimated that between one and two dollars worth of compressed gas will be sufficient for one car on a transcontinental trip. The gas heater is suspended outside the car and a fluid in pipes between the floor and floor racks distributes the heat.

Increases Lead Tolerance

More lead residue is permitted on fruits shipped in interstate commerce under an order issued last month by Secretary Wallace The increase is from 0.018 to 0.025 grains per pound. It was granted after extensive investigation by the Department of Agriculture.

Workers Get Pensions

All full-time employees of Campbell Soup Co., Camden, N.J., are to benefit by a retirement pension fund which will supplement the old-age security provided by the Social Security Act. Retirement age is reached at 65, and the rate of retirement income is one per cent of the employe's average annual rate of earning during the five-year period immediately preceding Dec. 31, 1937, multiplied by the number of full years of service. That is, an employee 30 years with the company and with an average earning of $1,200 a year would receive an annual pension of $360, or $30 a month. This benefit program cost Campbell Soup Co. $2,753,000 in a lump sum, and the plan is paid for by the company as far as low-salary workers are concerned.

CONCENTRATES

• Fifty-one handlers of milk supplying the New York metropolitan area signed a Federal milk marketing order late last month. This agreement parallels a Federal-State marketing program, effective Sept. 1, which establishes minimum prices for fluid milk and for eight other classes of milk. . . . Trade practice rules designed to take any chiseling out of the tomato paste manufacturing industry were promulgated by the Federal Trade Commission on Sept. 3. . . . A trade practice conference for the wine industry was held in San Francisco last month under the auspices of FTC.

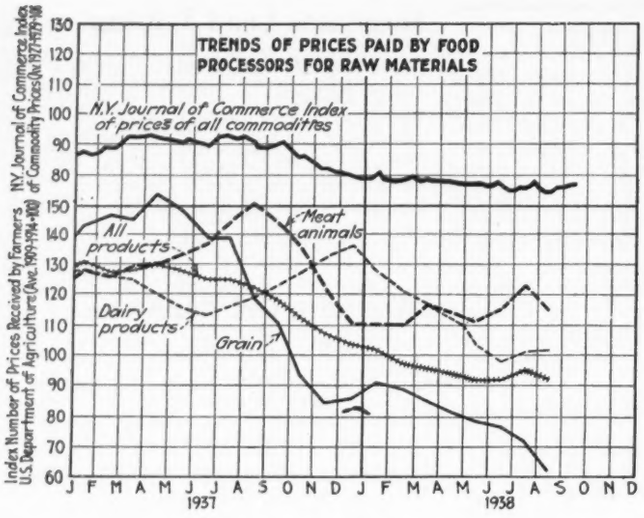
• *Nineteen malt manufacturers have been charged with price fixing by FTC. All are members of United States Maltsters Association, Chicago. . . . Five trade associations and member manufacturers who produce veneer containers used in packaging fruits and vegetables are charged by FTC to have been guilty of fixing prices for their products.*

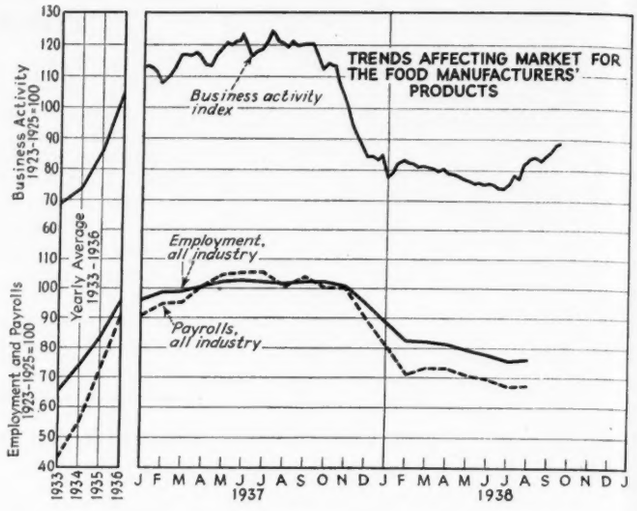
• Federal regulations pertaining to the labeling and advertising of wine have been amended relative to standards of identity and other matters. . . . New rules issued by the Department of Agriculture forbid the use of beans in chili con carne unless the product is plainly so labeled. The rules provide that chili must contain 40 per cent by weight of meat, not more than 8 per cent of cereal nor more than 25 per cent of animal fat other than normal to the meat. The same rules set standards for corned beef hash, requiring 35 per cent of beef.

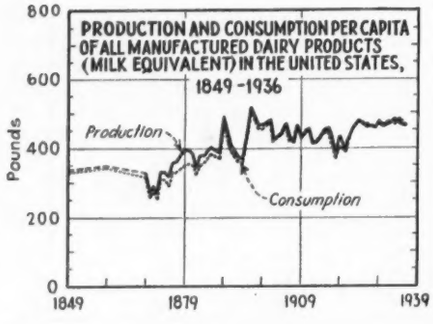
• *Authority to purchase ten million pounds of butter from Dairy Products Marketing Association, producer cooperative, was granted Federal Surplus Commodities Corp. on Sept. 1. A loan of $7,250,000 to the DPMA was approved on Aug. 20 by AAA, and a loan of $14,500,000 had been authorized in June. . . . FSCC has been authorized to purchase surplus dried clingstone and freestone peaches in California. . . . AAA has announced a program for diverting 1,750,000 lb. of substandard dates produced in California and Arizona from regular channels of trade to byproduct use. . . . A new surplus-wheat purchase program was announced late in August by Secretary Wallace.*

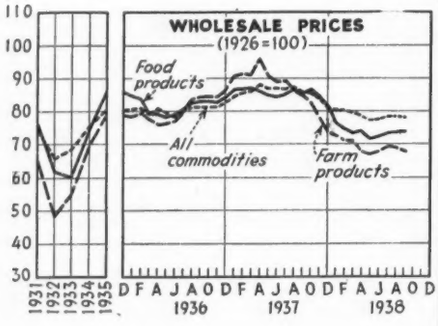
• Canning Machinery & Supplies Association has announced that the usual display of heavy machinery will be missing from the 1939 exhibit, to be held in conjunction with the canners convention. However, practically every member of the association is expected to have an informative exhibit. . . . Corn bread, made not from meal but corn flour, and resembling wheat-flour bread, is being made in Caracas, Venezuela. . . . Development of food manufacturing industries in the Philippines is an aim of National Development Co. of Manila, which has established a subsidiary corporation for canning and preserving meats and other food products.

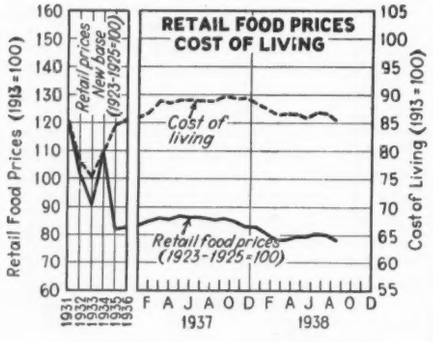
• *National Bureau of Standards announces that printed copies of Simplified Practice Recommendation R170-38, Spice Containers (Tin and Fiber), are available through the Government Printing office for 5 cents. . . . The "speaking service" of American Can Co., started at the request of organizations interested in knowing the facts about canned foods, is booked eight months in advance. Already it has reached over 30,000 men in the wholesale and retail food fields.*


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
All products
Meat animals
Dairy products
Grain
Index Number of Prices Received by Farmers U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Ave. 1927-1929=100)
J F M A M J J A S O N D J F M A M J J A S O N D
1937
1938


TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Business activity index
Employment, all industry
Payrolls, all industry
Business Activity 1923-1925=100
Employment and Payrolls 1923-1925=100
Yearly Average 1933-1936
1933
1934
1935
1936
J F M A M J J A S O N D J F M A M J J A S O N D J
1937
1938







Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *Business Week*. The cost of living index is from the National Industrial Conference Board. The data on production and consumption per capita of all manufactured dairy products are from the Department of Agriculture.

BUSINESS TRENDS

Czech War Scare Pushes Commodity Prices Upward

Almost exactly reversing the movement from mid-July to mid-August, general commodity prices turned upward in the five weeks ending September 17, 1938. From a figure of 74.7 on August 13, the *New York Journal of Commerce's* weekly index of commodity prices moved up to 77.1 on Sept. 17. This figure compares to an index of 77.3 on July 16, two months before.

Several factors operated to cause this change. Most important was the general European turmoil over the Czech-German controversy. This caused improved demand for various commodities. Another favorable factor was the Sept. 1 crop report, which indicated that some crops, particularly corn, would not be so abundant as had been thought in August. Finally, general business continued to show improvement.

Increases were also recorded by other commodity indexes for the period. The index of the National Fertilizer Association rose from 73.1 on Aug. 13, 1938, to 73.6 on Sept. 10, 1938. Fisher's index of commodity prices on Sept. 10, 1938, stood at 80.7 while on Aug. 13, 1938, it was 79.9. Recovery also marked the *New York Journal of Commerce's* sensitive daily index of commodity prices, which rose from 116.2 on Aug. 17, 1938, to 119.7 on Sept. 17, 1938.

Individual food prices shared the general upward trend during the period. No. 2 hard winter wheat rose from 59¼ cents on Aug. 16 to 63½ cents on Sept. 16. Pork loins rose from 17 cents on Aug. 16 to 24½ cents on Sept. 16. In the same period eggs increased from 22¼ cents to 26½ cents and canned tomatoes from 57½ cents to 61 cents. Sugar increased in price for the raw, duty paid, from $2.75 to $3. In contrast, some foods showed declining prices in the period. Cheese fell from 13¾ cents to 12 cents, cocoa from $5.44 to $5.10, beef from 15½ cents to 15 cents, and lard from $8.50 to $8.40.

For July, the latest month available, United States exports of foodstuffs showed a considerable increase. The recorded value in that month was $24,566,000, compared to $20,988,000 in June, 1938, and $5,925,000 in July, 1937.

Imports of foods in July remained stationary compared to the preceding month but were only half the imports of July, 1937.

Large shipments of grains were the cause of the high July food exports. This movement was based on the low prices of grains and was stimulated by the abundance of grain supplies in the U. S.

Crop Estimates Revised Lower Yields Expected

Sept. 1 estimates of the Crop Reporting Board of the U.S. Department of Agriculture show several declines for important crops. Unfavorable weather in late July and in August was largely responsible for these decreases, particularly in the cases of corn and spring wheat. The estimates for the more important crops follow:

Crop	Sept. 1, 1938	Aug. 1, 1938
Corn	2,454,526,000 bu.	2,566,221,000 bu.
All wheat	939,972,000 bu.	955,989,000 bu.
Winter wheat	688,458,000 bu.	688,458,000 bu.
All spring wheat	251,514,000 bu.	267,531,000 bu.
Durum wheat	42,011,000 bu.	41,148,000 bu.
Oats	1,034,347,000 bu.	1,041,009,000 bu.
Barley	250,360,000 bu.	248,283,000 bu.
Rye	52,500,000 bu.	52,500,000 bu.
Buckwheat	7,194,000 bu.	7,406,000 bu.
Rice	54,018,000 bu.	53,595,000 bu.
Beans, dry edible	14,209,000 bags	14,252,000 bags
Potatoes	377,875,000 bu.	385,515,000 bu.
Sugar cane, for sugar	7,156,000 tons	7,156,000 tons
Beets, for sugar	10,823,000 tons	11,138,000 tons

Outlook for Livestock

Larger marketings of hogs are expected for the marketing year 1938–1939, beginning Oct. 1, 1938, according to the Bureau of Agricultural Economics. This year's spring pig crop was larger than in recent years and it is also likely that the fall pig crop will be large. Therefore, in spite of the relatively low storage stocks of pork products, and in view of the low consumer demand which is still restricted by unemployment and low business levels, prices of hogs and hog products are expected to be lower in 1937–1939 than in the 1937–1938 marketing year.

Supplies of lambs and sheep are also greater this fall than was the case a year ago. However, this greater supply of animals is expected to be offset, at least in part, by a better demand for meat, skins and wool. Therefore the natural tendency for the price to decrease in the face of large supplies will be largely offset by this improved demand, in spite of the fact that the 1938 lamb crop was the largest in more than eight years.

With beef cattle, the seasonal decline in prices this year is expected to be smaller than usual. The Bureau of Agricultural Economics expects that marketings of grain-fed cattle will continue larger than in 1937 for the remainder of this year and for early 1939. Marketings of cows, heifers and grass-fed steers, however, are expected to be smaller than a year ago, at least until the end of this year. In general, total marketings of cattle are expected to be about the same during the remainder of 1938 as in the corresponding period of 1937. Calf marketings will be smaller.

Beef prices will be influenced by the relatively large supplies of hogs and sheep, but a counter influence is expected from larger consumer demand. Therefore, prices of better grades of cattle are not likely to drop as much during the next three or four months as they did a year ago.

These general trends are currently confirmed by the performance of prices in the Chicago livestock market.

Construction News

	Pending (thousands)	Awarded Sept. (thousands)	Total Awarded 1938 (thousands)
Bakery	$155	.....	$688
Beverages	610	$565	3,842
Canning and Preserving	80	.....	240
Confectionery	40	.....	62
Grain Mill Products	375	.....	570
Ice Manufactured	.....	.....	260
Meats and Meat Products	280	65	1,858
Milk Products	130	45	642
Miscellaneous	150	220	4,634
	$1,820	$895	$12,796

Canned Peas Output at High

Estimates of the 1938 production of canned peas indicate that an all-time high of 25,039,025 cases has been reached. According to the National Canners Association, which made the estimate, the next nearest year's output was 24,698,003 cases in 1935.

With a carry-over from last year's pack estimated at around 4,000,000 cases, it is evident that the consuming industry is faced with a total stock of around 29,000,000 cases. About 19,500,000 cases of the 1937 production was consumed, indicating that the canning industry may have a serious problem on its hands in disposing of the present supply.

Sugar Deliveries Lower

For the first eight months of 1938, deliveries of sugar by the refiners, beet sugar makers and importers of the United States totaled 4,130,426 short tons, raw value, according to AAA. This was a reduction of 12.3 per cent from the 4,907,587 tons delivered during the same eight months of 1937.

Meanwhile, stocks of sugar held by refiners were greater on Aug. 31, 1938, than was the case a year before. The total reported for the date this year was 713,575 short tons, raw value, compared to 605,871 tons on the same date in 1937.

Business Makes More Gains

Continued gradual improvement marked the course of business in the period from mid-August to mid-September. In the four weeks from Aug. 20 to Sept. 17 the *Business Week* index of business activity advanced from 84.5 to 89.4, an increase of 5.79 per cent. This rise indicates that the hoped-for fall pick-up in business made a good start, as the rise in this index in the preceding five-week period was only 1.12 per cent.

Other indexes and indicators of business activity performed as might be expected in the period from Aug. 20 to Sept. 17. Automobile production fell off from 23,940 to 16,100 because of model change-overs. Steel production rose from 40.4 to 45.3 per cent of capacity. Heavy engineering construction awards increased from $44,479,000 to $53,569,000. Electric power production fell off slightly during the period.

The United States Department of Labor indexes of wholesale prices for the five weeks from Aug. 13 to Sept. 17 showed 0.51 per cent gain for the general index, a 2.69 per cent rise for the farm price index, and a 3.60 per cent rise for the food price index. The weekly weighted commodity price indexes of the *New York Journal of Commerce*, in the period from Aug. 20 to Sept. 24, rose 1.06 per cent for the general index, increased 1.41 per cent for the grain price index, and rose 2.54 per cent for the food price index.

INDICATORS

BUTTER PRODUCTION in July, 1938, was estimated by the U.S. Department of Agriculture at 183,651,000 lb., compared to 171,108,000 lb. in July, 1937, and a 1929–1936 average for the same month of 171,307,000 lb.

OLEOMARGARINE SALES in July, 1938, totaled 26,812,970 lb., compared to 27,723,900 lb. in July, 1937, as represented by tax stamp sales.

KRAUT CABBAGE PRODUCTION for canning in 1938 is estimated by the U. S. Department of Agriculture at 238,600 tons, compared to 153,200 tons in 1937.

CHERRIES, pitted red sour, canned in 1938, totaled 1,683,611 cases, according to the National Canners Association. The 1937 pack was 2,471,982 cases.

FROZEN FRUITS in storage, Sept. 1, 1938, totaled 150,267,000 lb., compared to 151,351,000 lb. on Aug. 1, 1938.

FROZEN VEGETABLES in storage, Sept. 1, 1938, were 59,963,000 lb., compared to 45,851,000 lb. on Aug. 1, 1938, and 22,036,000 lb. on Sept. 1, 1937.

BUTTER, creamery, in storage on Sept. 1, 1938, amounted to 201,543,000 lb. On Sept. 1, 1937, the stored butter was 134,885,000 lb. and the 1933–1937 average for the date was 139,958,000 lb.

CHEESE, all kinds, in storage Sept. 1, 1938, totaled 150,343,000 lb., against 122,647,000 lb. a year previous and a 1933–1937 Sept. 1 average of 113,314,000 lb.

EGGS, case equivalent, in storage on Sept. 1, 1938, were 9,523,000 cases, compared to 12,969,000 cases on Sept. 1, 1937, and a 1933–1937 average for the date of 11,335,000 cases.

POULTRY in frozen storage on Sept. 1, 1938, totaled 54,992,000 lb., against 63,733,000 lb. a year previous, and a 1933–1937 average for Sept. 1 of 51,595,000 lb.

MEAT, all kinds, in cure and storage on Sept. 1, 1938, was 432,778,000 lb., compared to 463,435,000 lb. on Sept. 1, 1937, and a 1933–1937 average for the date of 608,486,000 lb.

LARD in storage on Sept. 1, 1938, was 116,682,000 lb. On Sept. 1, 1937, the quantity stored was 118,094,000 lb., and the 1933–1937 Sept. 1 average was 134,765,000 lb.

FISHERY PRODUCTS in cold storage on Aug. 15, 1937, amounted to 75,392,000 lb., compared to 66,204,000 lb. on Aug. 15, 1937, and a five-year average for the date of 61,624,000 lb.

WEEKLY FOOD INDEX of Dun & Bradstreet was $2.44 for the week ending Sept. 13, compared to $2.89 a year before.

MEN, JOBS and COMPANIES

INDUSTRY

» AMERICAN CANDY Co.'s board of directors has recommended to the stockholders that the Milwaukee company dissolve voluntarily and go out of business. Declining sales and labor problems prompted this drastic move. Stockholders will meet Oct. 10 to consider the proposal.

» BURRY BISCUIT CORP. has made its third addition to existing plants in the Clearing industrial district adjacent to Chicago. With headquarters at Linden, N. J., the company located its first plant in the Midwest in 1933.

» COCA-COLA BOTTLING Co. of California will operate a complete bottling plant in the Hall of Foods and Beverages at the 1939 Golden Gate International Exposition. All of the beverage dispensed at the Fair will be bottled in this plant.

» COLONIAL SALT Co., Akron, Ohio, a $1,000,000 firm, has been purchased by a group of employees.

» FORTUNE BROS. BREWING Co. began operations in its bottling plant shortly after Aug. 1. Previously, its beer, made by the Siebel simplified brewing process, had not been available in bottles.

» GUY P. HALFERTY will convert the Pioneer canning plant, Aberdeen, Wash., into a large cannery for packing tuna. An addition measuring 80x110 ft. will be made to the plant and new equipment will be installed.

» CHR. HANSEN'S LABORATORY, INC., Little Falls, N. Y., has purchased the fudge mix business of Golden Nugget Sweets, Ltd., San Francisco. The mix recently was introduced into the Midwest.

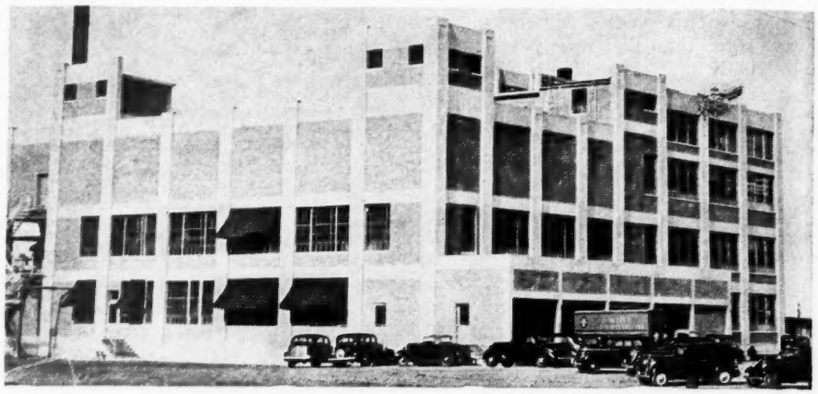
» HATHAWAY BAKERIES, INC., Cambridge, Mass., will spend $50,000 at its Richland Ave. plant for increased packing, shipping and garaging facilities.

» HI-CLASS BAKING Co., Evansville, Ind., has purchased Decatur (Ind.) Bakery and has remodeled it.

» HONOR BRAND FROSTED FOODS CORP. will increase its volume by 100 per cent next year, according to Max Waterman, president.

» MICHIGAN SUGAR Co., Bay City, is spending $110,000 for repairs and improvements at its Carrollton plant.

» PECHTER BAKING Co., New York, suffered a loss estimated at $75,000 on Aug. 27 when its plant was damaged by fire.



MILLION-DOLLAR PACKING PLANT FOR SOUTH

Swift & Co. recently dedicated this new $1,000,000 packing plant at Lake Charles, La. This unit, to which another will be added within the next twelve or fifteen months, has facilities to handle 250 cattle and an equal number of sheep and hogs daily.

» S. & H. BAKING Co., recently opened a bakery at Iola, Kan. The company also operates plants at Manhattan, Eureka and Eldorado.

» STANDARD BRANDS, INC., has moved its Indianapolis branch into larger quarters. The new location is a two-story brick building with 2,000 sq.ft. of office space, 6,000 sq.ft. of garage facilities and 4,700 sq.ft. to be used as a warehouse and storeroom.

» STOKELY BROS. & Co. has purchased one of the largest buildings of the old Marmon Motor Car Co. at Indianapolis. Of steel and concrete construction, the building contains 250,000 sq.ft. of floor space.

PERSONNEL

» ALBERT BENSON has been named president and general manager of Soo Brewing Co., Sault Ste. Marie, Mich., succeeding Louis Noel, who remains on the board of directors.

» J. T. BIGGER has been appointed manager of the Birmingham branch of Cudahy Packing Co. He formerly was with the Tampa division of the company.

» CLINTON BROOKE, who had been with National Grain Yeast Corp. at Belleville, N. J., has been transferred to Chicago to do technical sales work throughout the Midwest.

» FRANCIS CHAMBERLAIN, for 32 years with the investment banking house of Coffin & Burr, Inc., Boston, and recently office manager of that house, has been appointed head of the administrative division of Cranberry Canners, Inc., South Hanson, Mass.

» W. J. COAD, JR., has become general manager of Omar Mills, Inc., Omaha. He had been vice-president and treasurer. Harold Roth was made vice-president and assistant general manager in charge of the Denver mills. L. L. Brietenbauch is vice-president in charge of Eastern sales.

» FRANK CRADDOCK retired recently as secretary of Tennessee-Kentucky Canners Association because of ill health. The duties of the secretary have been taken over by S. R. Clevenger, vice-president and sales manager of Bush Bros. & Co., Dandridge, Tenn.

» JAMES D. CRONIN has been transferred from the Brooklyn, N. Y., plant of Fanny Farmer Candy Shops, where he was general manager, to the company's factory at Minneapolis, where he is manager. M. I. Farrell succeeds him at Brooklyn.

» JAMES J. CUFF, formerly with Cuff Packing & Provision Co., has taken a position with Danahy Packing Co., Buffalo. He will direct the company's plans for expansion.

» GLENN M. DAVIDSON, plant superintendent of Durkee Famous Foods at Elmhurst, N. Y., for the past few years, has been transferred to the Chicago office of the company as assistant general superintendent of the food division.

» R. C. DUNCAN heads up National Kraut Packers Association for the

coming year. He is with the Cleveland Kraut & Pickle Co., Huron, Ohio.

» J. D. EVANS, for ten years president and general manager of Rea-Patterson Milling Co, Coffeyville, Kan., has gone with Darling Flour Co. as sales manager.

» FORREST GANNON succeeds J. H. Lindeman, retired, as secretary of Reid Murdoch & Co., Chicago. M. A. Joffee was elected treasurer of the company, having previously been assistant treasurer.

» JOHN W. GARDNER has been transferred from the Belleville, N. J., plant of National Grain Yeast Corp. to be superintendent of the company's plant at Crystal Lake, Ill.

» ALVIN GRIESEDIECK, son of the late Joseph Griesedieck, founder of Falstaff Brewing Corp., has been elected to succeed his father as president of the St. Louis firm. He had been vice-president of the brewing company since 1933. William Aitken, auditor, was elected to the position of treasurer of the brewing corporation.

» HOWARD J. MOUNTREY resigned recently as vice-president of Borden Sales Co. in charge of sales and advertising. He had been with Borden for many years.

» KARL SCHNORR, chief engineer of National Grain Yeast Corp., is to be transferred back to Belleville, N. J., shortly after Oct. 1. This transfer follows the completion of the rebuilding of the old Bowman Dairy Co. plant at Crystal Lake, Ill., into a 25,000-lb. per day yeast plant.

» W. W. SHANNON has resigned as vice-president and general manager of Thomas J. Lipton, Inc., Hoboken, N. Y. Mr. Shannon had been in charge of sales and advertising. His duties have been assumed by C. I. Wood, who has been vice-president and assistant general manager of the company for many years.

» GEORGE A. SMITH has resigned from American Maize Products Co. to join the chemical research staff of Clinton Co., Clinton, Iowa.

» L. D. WHITING, formerly chief chemist of Ballard & Ballard Co., Louisville, is now in charge of production and management of the company's mills. He succeeds Henry Steiger, who died Aug. 15. Henry Kruse was promoted to superintendent of the Louisville mill and reports to Mr. Whiting.

» WILLIAM F. ZASTROW, for the past 22 years manager of the Clintonville, Wis., plant of Straubel Cheese Co., has been transferred to Freeport, Ill. He is succeeded at Clintonville by Fred J. Buss, formerly in charge of the firm's Antigo, Wis., plant.

DEATHS

» JOHN L. ACKLEY, 72, founder of Penn Yan (N. Y.) Pure Foods Co. and widely known through services with the pure food enforcement division of the New York State Department of Agriculture, Aug. 20.

» B. G. ASSELIN, owner of an ice cream plant at Alpena, Mich., Sept. 8.

» ADOLPH SCHNEIDER, president of Indian Village Bakery, Detroit, which he founded 36 years ago, Aug. 17. He was one of the first bakers to deliver from house to house.

» KEITH SETSER, 55, general manager and vice-president of Brownsville Canning Co., Reeseville Canning Co. and Hustisford Canning Co., Aug. 24, at Milwaukee.

» GUY C. SHEPARD, retired vice-president of Cudahy Packing Co., Chicago, and administrator of packing house products under the Farm Relief Act in 1933, Sept. 4, at Evanston, Ill.

» MICHAEL T. SNYDER, 79, one of the founders of United Fruit Co. and a pioneer banana planter, Sept. 5, at New Orleans.

» A. L. SOMERS, 65, president and general manager of Holsum Bakery Co., Fort Wayne, Ind., Aug. 31.

» LAWRENCE J. THURM, treasurer of Kansas Flour Mills Corp., Kansas City, Mo., Aug. 12. He was formerly treasurer of Farmers National Grain Corp., Chicago.

» JAMES A. URQUHART, 81, former manager of National Biscuit Co., Sept. 5, at Toronto.

ASSOCIATED INDUSTRIES

» CHAIN BELT Co., Milwaukee, reports the death of Carl L. Pfeifer, treasurer, on Aug. 24, at Philadelphia.

» CATERPILLAR TRACTOR Co. reports the death on Aug. 24 of C. Parker Holt, vice-president and director.

» MIXING EQUIPMENT Co. has placed C. S. Quillen in charge of field engineering in New York City and its central-southern territories.

» MONO SERVICE Co. announces completion of a five-year program for replacement of machinery and equipment. The company recently occupied a new five-story building.

» NATIONAL ADHESIVES CORPORATION, New York, has named Alexander Alexander chairman of the board. Frank K. Greenwald succeeds Mr. Alexander as president.

» OWENS-ILLINOIS CAN Co., Toledo, has named I. F. Roberson manager of a new branch office opened in Cleveland.

» WESTINGHOUSE ELECTRIC & MFG. Co., East Pittsburgh, had appointed Frank D. Newbury manager of its new products division.

CONDITIONED AIR KEEPS CELERY CRISP

Twelve tons of celery can be reduced from 80 deg. F. to 34 deg. in 24 hours in this air-conditioned storage room in the new plant of La Choy Food Products Co., Detroit. And dehydration during storage is minimized by a small difference between the temperature of the room and that of the refrigerating coils. So the celery is kept crisp until it goes into the canned chop suey. This room is also used to cool cans of chop suey from 130 deg. to 34 deg. in 24 hours. A Carrier cold diffuser conditions the air.

Locker Plants

(*Continued from page 568*)

farms. The modern farm housewife goes to the ice box or mechanical refrigerator for her daily food supplies instead of to the smokehouse or the fruit cellar.

Vegetables and fruits have become popular items in the farm family's locker. The locker has greatly reduced, often ended home canning. Home canning on the farm is at best time-consuming drudgery, too often resulting in disheartening returns for the labor. Spoilage from home-canning is considerable. There need be no spoilage of frozen food, especially when the directions supplied farmers by the Department of Agriculture are followed.

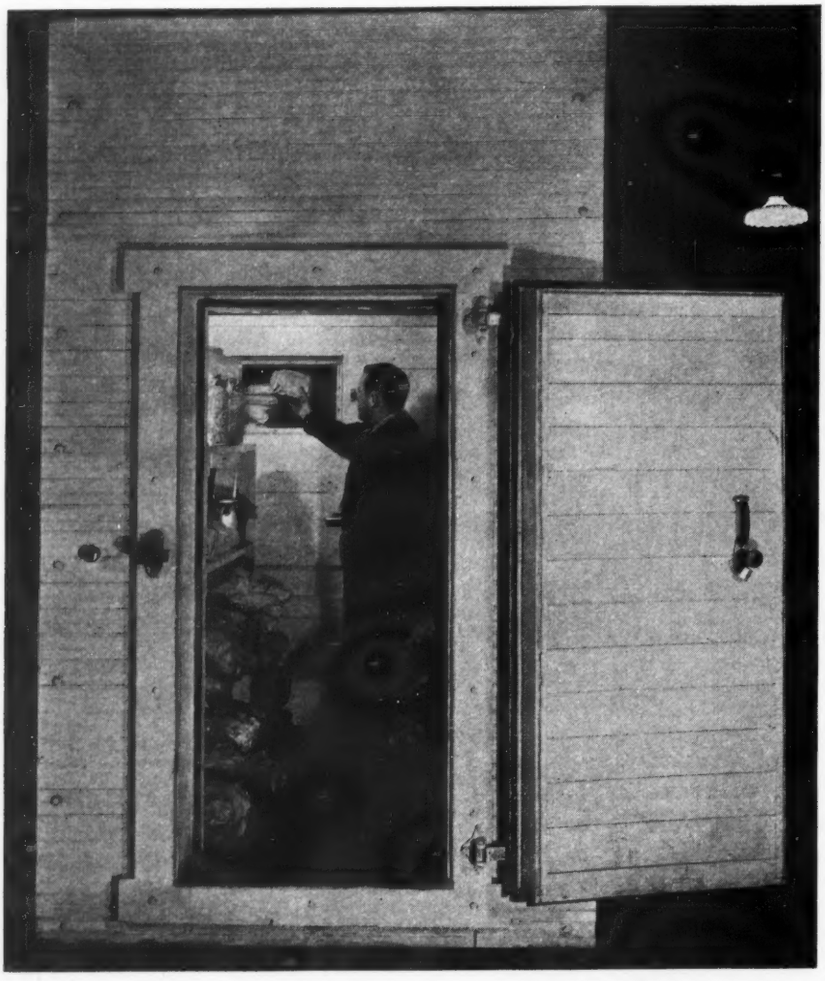
The first use of the locker plant was for the storage of fresh meat. This is still the major use. A farm family renting a frozen food locker may butcher at any time of the year, save feed on the butchered animal and have fresh meat the year round. At the end of the chicken season, when friers and broilers are prime, the unsold birds are frozen to provide young birds for the farm family when only old birds are on foot.

Many farm families even put smoked meat in the lockers, not meat smoked heavily to carry it through a long winter, but the light smoked meat the city cousins buy, too lightly smoked to last the winter without the low temperatures of the locker plant.

Farm families gain many advantages from the use of the locker plant. The use of a locker for frozen food creates for the farmer a real saving in the cost of the yearly food bill. The farm family can have fresh meat the year round at little above producing cost and pocket the middle man's profit. Farm animals and poultry to be frozen may be butchered or dressed when prime, saving the cost of feed necessary to carry them until the weather is suitable for slaughter for smoking or canning. Because it requires less labor and less time to prepare fruits and vegetables for freezing than to can them, more of this type of farm produce can be and is frozen with less effort than could be preserved by earlier farm methods. As a result, the farm family using the frozen food locker is provided with a year round supply of fresh foods, better foods at less cost, than those who do not employ the locker.

Although there are in the country many more limited service locker plants than there are full or complete service plants, the complete service plant is the type of plant of greatest significance.

The "complete service" locker plant and the effect of the locker plant industry on the other food industries will be discussed in the November issue of Food Industries.



A 'limited service" locker plant serving a very limited number of patrons.

Table I—Approximate Number of Locker Systems of All Kinds in Operation in 32 States

States	*Number of Locker Operations*
Arkansas	1
California	75
Colorado	10
Florida	1
Georgia	1
Idaho	50
Illinois	60
Indiana	20
Iowa	225
Kansas	100
Kentucky	5
Massachusetts	1
Michigan	20
Minnesota	85
Missouri	20
Montana	10
Nebraska	100
New Jersey	1
New York	4
North Dakota	10
Ohio	10
Oklahoma	50
Oregon	150
Pennsylvania	7
South Dakota	15
Tennessee	3
Texas	5
Utah	5
Virginia	1
Washington	250
Wisconsin	65
Wyoming	5
TOTAL	1,365

Table II—Types of Businesses Operating Locker Plants

Results of a Study of 136 Plants

Type of Business	*Number of Plants*
Creamery	20
Ice Manufacturers	21
Ice and Cold Storage Plants	3
Ice and Creamery Plants	1
Ice and Producer Plants	1
Ice Cream Manufacturers	8
Meat Markets (retail)	6
Cooperative Farm Bureaus	5
Cold Storage Plants	4
Gasoline Service Stations	3
Lumber Yards	2
Beer Distributor	1
Radio and Refrigerator Distributor	1
General Contractor	1
Garage	1
Roller Mill	1
Retail Grocery	1
Wholesale Produce	1
Poultry Hatchery	2
Plants built primarily to provide locker storage	44
Unknown	7
TOTAL	136

Engineering at 57th St.

(*Continued from page 554*)

wise partition to permit operation of half of it while the other half is down for repairs. Each section has an agitator to circulate the brine over the submerged cooler and around the ice cans.

The greatest saving in the operation of the ice field comes from having the ice cans fastened together in groups of ten and using a 2½-ton traveling electric hoist to put the cans into and take them out of the field. One man operates the 100-ton ice field, with the assistance of the hoist, a can dump and a cake ice conveyor leading through the scoring machine to the ice storage room. The ten cans, after dumping, are filled from a battery of ten tanks, each containing 300 lb. of water; float valves control the amount of water in the tanks.

Also economical of labor are the flake ice machines, and these also save in refrigeration. Six of the machines operate with no one in attendance, producing 60 tons of flake ice daily. To freeze that much ice in the form of cakes and then crush it and convey it to a bin would require an appreciable amount of labor, plus the cost of power to operate the crusher and the loss of ice due to melting while being crushed and handled. Moreover, as an ice plant, the flake ice machine is much more efficient than an ice field. It requires only one ton of refrigeration per ton of ice, as compared to about 1½ ton of refrigeration per ton of cake ice.

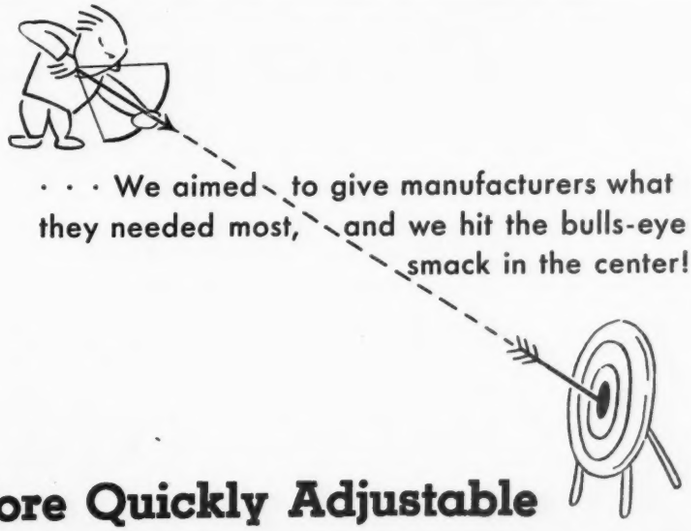
FOR THOSE who are not familiar with it, the flake ice machine consists essentially of a flexible metal cylinder through which brine circulates. This cylinder slowly revolves, dipping into water which freezes in a thin film on the outside of the cylinder. To remove this ice, the cylinder is flexed automatically so that the ice peels off, breaking into flakes as it falls into the bin below.

The flake ice machines discharge into bins by gravity, and a power driven rake operated by one man conveys the ice to the discharge outlets of the bins. Icing of cases of bottled milk is done automatically through a trip switch on the case conveyor. A measured amount of ice is discharged into each case, the amount being variable in 2-lb. increments between 4 lb. and 14 lb.

Further steps in the interests of dependability and economy in the refrigeration plant include the connection of all compressors to both a high-pressure and a low-pressure header, so that any compressor or combination of compressors may be operated for any service, according to the load. This permits selection of compressors so that the machines are operated at full load and high efficiency.

Not least in importance among the features of the refrigeration plant is the layout of the engine room. All the ammonia equipment is on one side and the brine equipment on the other, this making for short piping connections. Short piping is also attained by locating the flake ice machines and flake ice bins in a vertical line with the brine tanks. The cooling tower, too, is almost directly over the ammonia condensers.

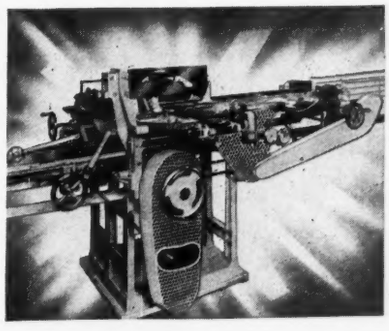
To economize in the amount of refrigeration, heavy insulation was used. The brine and ammonia-suction lines are insulated with two layers of hair felt protected by a waterproof jacket of roofing paper covered with asphalt paint. The brine tanks are insulated with 6 in. of rock cork, a mineral insulation in board form. Not only is



A More Quickly Adjustable Wrapping Machine—Model FA-Q

With our new Model FA-Q, you can change from one size package to another *in only ten minutes*—one third of former time for this adjustment. Hand wheels are conveniently located for all adjusting . . . no tools are required.

Moreover, the FA-Q has an extremely wide size range. And it can be equipped to handle glassine, transparent cellulose, waxed paper, foil, or plain paper wrappers. Such versatility makes it ideal for manufacturers in many fields.



Speed is 40 to 70 packages per minute, depending on the size and nature of the package. Uses roll or sheet feed. ELECTRIC EYE may be provided for registration of printed material fed from a roll.

Compare your present wrapping methods with the advantages offered by the FA-Q. Consult our nearest office.

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Over a Quarter Billion Packages per day are wrapped on our Machines

this more easily applied than cork, but it is more permanent.

Another point about the engine room is that the brine pumps were selected with a capacity which permits various numbers of them to be operated in accordance with the load. This assures operation of each pump at near full load, the most efficient point for both it and the motor driving it.

Heating of space in the plant is done by two separate systems. The garage areas, in general, are served by unit heaters hung from the ceiling where they are out of the way. These are supplied with steam at 10 lb. pressure direct from the boilers. Temperature is controlled by thermostats which stop and start the motors driving the fans of the heaters.

A vacuum-pressure heating system is employed to heat the offices, except where it is more convenient to supply radiators from the 10-lb. steam main. With this system the temperature of the steam supplied to the radiators is controlled by varying the pressure at which it is supplied. And the quantity of steam supplied is controlled by regulating the difference between the pressures on the supply and discharge sides of the system. A vacuum pump provides the differential in pressure. This system is controlled by the engineer in accordance with the outside temperature, which temperature is recorded on the instrument board in the engine room.

Advanced technic in ventilation and air conditioning is taken advantage of to improve conditions in parts of the plant, in the offices and in the reception room where visitors are entertained. Complete air conditioning is employed only for the reception room. The air delivered to this room is passed through a filter and over heating and cooling coils. The heating coils regulate the final temperature of the air, while the cooling coils chill it to precipitate part of the moisture and reduce the humidity. The temperature of the air is automatically controlled by three thermostats, one in the fresh-air intake, one in the duct supplying air to the reception room and one in the reception room itself. These thermostats control the steam admitted to the heating coils through air-operated valves. The humidity is regulated by a humidistat, located in the reception room. This regulates the amount of ice water supplied to the cooling coils, controlling the temperature of these coils and the amount of water they precipitate from the air. A manually operated switch in the reception room causes the system to pass all outdoor air or part outdoor air and part recirculated air.

Circulation of air through the bottle washing, pasteurizing and filling, equipment washing, can dump rooms and offices is provided through ducts, by a large blower. The air in this system is filtered and is heated in cold weather. It passes over a preheater with the capacity to raise the temperature from 10 to 31 deg., then over a reheater which brings the temperature up to 64 deg. The heaters are automatically controlled, and the two-stage arrangement makes for more accurate control and more efficient heating.

Fresh air, heated as required, is also supplied to the tank-scale room, can-storage room and engine room by a fresh-air unit heater located in the basement.

The filters used for cleaning the air in the ventilating and conditioning systems are a dry mat composed of thin sheets of gauzy cellulose tissue, like cotton. This filter is thrown away when plugged, and it is purchased in rolls and cut to size as needed.

Maybe you don't know it—but—you are using from fifteen to fifty per cent

TOO MUCH FUEL

. . . that is, if you're baking bread . . . if you are roasting nuts or cocoa . . . if you are cooking hard candies—in general if you employ high temperatures in your processes. ★ The Kemp Industrial Carburetor, which premixes gas and air for complete combustion will correct this condition for you. And, for good measure, Kemp gives you automatic control, laboratory accuracy and wider turn-down range. ★ Our resident engineer in your section will be glad to show you just how these general statements will apply to your specific problem . . . to tell you whether you can save fifteen per cent of your fuel, or fifty per cent, or something in between. Tear out this ad *now*, and have your secretary write **The C. M. Kemp Manufacturing Co., 405 E. Oliver Street, Baltimore, Maryland.**

KEMP of BALTIMORE

New Discoveries

(*Continued from page 582*)

between apparent purity and sucrose purity can be derived. In arriving at these relations by the graphic method, all data must be referred to absolute dry matter content. From the experimental results, formulas can be set up from which the purity relations can be calculated.

Digest from "Studies of Ash Content Changes in Refinery Products," by Herbert Juttner, *Deutsche Zucker industrie* 62, 1087, 1109, 1937; 63, 45, 1938. (Published in Germany).

MISCELLANEOUS

Soap As A Coffee Byproduct

COFFEE GROUNDS contain oil, and soap manufacturers, in countries where every effort is being made to prevent diversion of edible oils from food uses, have extracted coffee grounds to ascertain the saponification behavior of this byproduct. The oil from coffee grounds is dark brown, with a distinct coffee odor. It is clear, and deposits no sediment even after long standing. Its specific gravity at 15 deg. C. (59 deg. F.) is 0.9439; its saponification number is 175.0, iodine number 55.0, free fatty acid content 5.5 per cent. The oil contains only 0.6 per cent unsaponifiable matter and readily forms a solid soap when treated with strong potash lye. In general it resembles coconut oil in saponification behavior. Its soaps are pale brown in color.

For better quality soap and greater byproduct value the oil can be hydrolyzed with acid reagents for recovery of the glycerin, and the free fatty acids can be distilled. This gives a practically colorless fatty acid, useful in making fine soaps. The idea of utilizing coffee grounds in this way is not as fantastic as it may appear. Large quantities could be collected in cities from hotels, restaurants, factory lunchrooms and army posts. There are even commercial uses for which the cellulosic residue would be salable.

Digest from "Oil From Coffee Grounds," by W., *Seifensieder-Zeitung*, 65, 178, 1938. (Published in Germany.)

Carotin

STARTING from an alfalfa drying establishment, a project for large scale production of carotin has been launched in Denmark. The plant has a capacity for handling about 3,000 long tons of material each season. The carotin will be extracted from roots having a sufficiently high carotin content for commercial utilization. Carrots stand high on the list but other roots can also be used.

Two main products are to be manufactured, namely carotin itself and a residue with relatively high content of certain vitamins. The final isolation of carotin and preparation of the residue will be carried out in a pharmaceutical factory. The principal use for the carotin will be for vitamin enrichment of margarine, to enable margarine to compete with butter as a source of vitamins. The utility of the vitamin-rich residue has not yet been fully established, but a preliminary experimental program has given results which indicate the material to be useful as an added ingredient in coffee, just as the carotin will be added to margarine.

Digest from "Production of Carotin in Denmark," "Rubriek voor Handle en Industrie," *Chemisch Weekblad* 35, 107(R), 1938. (Published in Holland.)

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Food Science vs. Technology

(*Continued from page* 547)

fermentologists, horticulturists, equipment designers, public health officials, and others who are interested in the common goal of better foods at lower costs for the American public.

Such a common meeting place would hardly be found either under the sole sponsorship of the American Public Health Association, the American Chemical Society, the Society of American Bacteriologists, the American Dairy Science Association, the American Association of Cereal Chemists, the American Institute of Chemical Engineers, the American Society of Mechanical Engineers, the American Society of Refrigerating Engineers, the American Society of Bakery Engineers, the Master Brewers Association of America, or any other existing professional group that we could name.

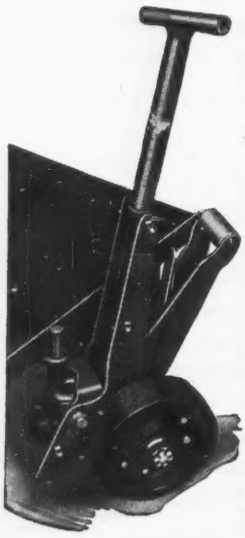
To furnish a common meeting place in the printed page is the function of this publication, which is devoted to the judicious blend of engineering, technology, science, research, production and distribution, as well as management, which characterizes the operation of a successful food company. But where can the men who follow these various specialized callings in the food field logically assemble in person to discuss their common problems, save in a wholly new sort of organization?

Food Technologists Organization Needed

The existing reluctance of some towards the thought of an organization of food technologists or food engineers apears to us to stem from a misconception of the term. A laboratory scientist is not a technologist, nor is a technologist a laboratory worker, though he may be equally at home in the laboratory, the experimental department or the plant itself. Our idea of a food technologist is that he is skilled in the science and the art of manufacture of food; and that the food engineer is one who is skilled in the science, the art and the proper engineering of production of food. In the case of proper engineering, we include not only design of equipment but the proper number of B.t.u., kw.-hr., man-hours, dollars, etc., per unit of food produced.

Several months ago we tried to present a study that would bring out the food engineering of a unit operation in the study of quality separation by differences of density (Food Industries, 10, 6, 68, 136, 1938). This study, involving a knowledge of physics, horticulture, food technology, food engineering and operating procedure, plus a trifling amount of chemistry, was one hardly appropriate for publication in a purely scientific periodical devoted to the results of research. By the same token, it would appear that food men who might be interested in such a problem would be unlikely to assemble at a meeting of a scientific society where the verbal discussions are devoted almost entirely to the results of scientific research.

It is quite evident, to us at least, that there is now no suitable existing organization for the meeting of the many types of minds that operate and direct the food industries. And it is equally apparent that such an organization is desirable and is needed. We feel, however, that it would be more successful if it were not set up as a scientific society or a branch of a scientific society.



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COLSON LIFT JACK SYSTEM

BOOKS RECEIVED

WHO GETS YOUR FOOD DOLLAR? By Hector Lazo and M. H. Bletz, executive vice-president and research director, respectively, of Cooperative Food Distributors of America. Published by Harper & Bros., 49 E. 33d St., New York, 1938. 129 pages; 6x9¾ in.; cloth. Price $1.25.

How the dollar spent by the consumer for food is divided between farmers, transportation, brokers and agents, food manufacturers, wholesalers and retailers has long been a mystery. Not only the housewife but the food manufacturer and all other factors in food supply as well have been generally unaware of the actual part of this dollar going to each interested party. In this book, the blank spot on the food map has been thoroughly explored and the detail filled in. Foods in general, and also specific food groups such as dairy products, cereals, meats and canned foods, were studied by the authors. The result is a simple, unbiased factual presentation of who gets each part of the consumer's food dollar and why they get it.

BIENNIAL CENSUS OF MANUFACTURERS, 1935. Published by The U. S. Department of Commerce, 1938. 1,279 pages; 6x9¼ in.; cloth. Price $1.75 (for sale by Superintendent of Documents, Washington, D. C.).

A tremendous quantity of authentic information concerning the hundreds of industries in the United States is included in this census. There is a great amount of material on the food industries—facts which mean little to the average man but become powerful ammunition in the hands of sales managers, public relations men, industrial relations experts and others who know how to use them.

AIR CONDITIONING. By Charles A. Fuller, with the collaboration of David Snow. Published by Norman W. Henley Publishing Co., 2 W. 45th St., New York, N. Y., 1938. 576 pages; 6⅞x9¼ in.; cloth. Price $4.

Readable yet practical books on air conditioning seem to be in season, as this is the second FOOD INDUSTRIES has received this summer. Mr. Fuller and his collaborator, Mr. Snow, cover the subject in a professional manner, but they have taken pains to write in layman language, eliminating much technical phraseology. Then they have presented the problems in such a way that only an average command of mathematics is necessary to handle calculations.

But lest we give the impression that there is no "meat" in this book, let us hasten to report that there are 300 illustrations, charts, tables, diagrams and floor plans. Then there are discussions on calculating heat gains, choosing air volumes, designing duct systems, choosing air handling and refrigerating equipment, how to select dehumidifiers, when to use direct-expansion refrigeration, how ice may be used in air conditioning, steam jet and water vapor systems of refrigeration, chemical dehumidification, well water systems, automatic control, prevailing codes and regulations, and many other things pertaining to the engineering of air conditioning.

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CHECK THESE SIX LO-BAX FACTS

1. KILLS BACTERIA QUICKLY
2. DISSOLVES QUICKLY—MAKES CLEAR DAIRY RINSE SOLUTIONS
3. CONTAINS 50% AVAILABLE CHLORINE
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SPOILAGE losses from bacterial contamination will take an enormous toll of profits in many food plants during 1938. Have you taken steps to safeguard *your* products by means of a rigid sanitary routine coupled with a dependable, quick-acting sterilizer like Lo-Bax? This convenient germ-killer is so economical that you can use it everywhere—on equipment, containers, floors, walls, ceilings. Write us for full information.

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PATENTS

Raw Meat Chopped or Ground in the Presence of a Curing Compound Followed by the Addition of a Spice, a Bitter Substance in Solution, and an Aromatic Substance in Solution—Ferhand Kabus, Chicago, Ill., to Angostura Wuppermann Corp., New York, N. Y. No. 2,123,336. July 12, 1938.

Vegetable Oils Selectively Hydrogenated in Presence of Catalyst That Suppresses Formation of Iso-Oleic Acid—William J. Paterson, Chestnut Hill, Mass., to Lever Brothers Co. No. 2,123,342. July 12, 1938.

Yeast Propagated in Batch Mixer Constructed to Increase Agitating Action in Wort Through Introduction of Aerating Air Through an Elevating Tube—Ivan Auguste Effront, Seclin, France. No. 2,123,463. July 12, 1938.

Chewing Gum Base Made From a Cyclic Aromatic Petroleum Resin and Natural Gum—George A. Hatherell, Roscoe, Calif., to Frank A. Garbutt, Los Angeles, Calif. No. 2,123,531. July 12, 1938.

Vitamin A Content Measured by Photosensitive Means—Ronald Lyman McFarlan, Marblehead Neck, and James Wallace Reddie, Hull, Mass., to United Drug Co., Boston, Mass. No. 2,123,573. July 12, 1938.

Fruit Wetted and Lubricated With Oily Substance Preparatory to Pitting in Machine Fitted With a Rubber Cup Having a Central Opening Through Which Pit is Forced by a Knife Penetrating Fruit From Opposite Side—Paul Wormser to Sussman, Wormser & Co., San Francisco, Calif. No. 2,123,644. July 12, 1938.

Machine for Making Bakery Products Consisting of Laminations of Thin Strips of Dough Separated by Thin Layers of Filling—Kenneth D. Loose, Bronxville, N. Y., Charles W. Watkins, and Joseph W. Green, Dayton, Ohio, to Loose-Wiles Biscuit Co., Long Island City, N. Y. No. 2,123,703. July 12, 1938.

Eggs Cleaned Mechanically by Use of Steel Wool—Earle C. Whipple, Goffstown, N. H. No. 2,123,759. July 12, 1938.

Confectionery Products Molded in Tubular Assembly Having a Closed End, Open End, and a Relatively Narrow Continuous Longitudinal Opening Along the Top Side—Norman M. Thomas, Brooklyn, and William J. Taylor, Syracuse, N. Y., to Joe Lowe Corp., New York, N. Y. No. 2,123,836. July 12, 1938.

Cakes Made Containing More Sugar Than Flour, Shortening Fat, and Small Quantity of Soap to Get Increased Volume Without Injury to Flavor—Herbert S. Coith, Albert S. Richardson, and Verling M. Votaw, Wyoming, Ohio, to Proctor & Gamble Co., Cincinnati, Ohio. No. 2,123,880. July 19, 1938.

Canned Foods Given Zoned Heat Treatment During Passage Through Compartment Equipped With Container-Supporting Rotating Drums Forming Part of Conveying Means—Horace L. Smith, Jr., and Lucian N. Jones, Richmond, Va., to Thermal Engineering Corp., Richmond, Va. No. 2,124,010. July 19, 1938.

Starch Separated From Gluten In a Combination Unit Comprised of a Flotation Vessel, a Filling Vessel, a Weir Between Filling and Flotation Vessels and a Partition Extending Into Liquid in Flotation Vessel in Front of Weir, Arranged to Provide for Removal of Waste Water as Well as Gluten—Hans Boie, Garby, Germany, to International Patents Development Co., Wilmington, Del. No. 2,124,284. July 19, 1938.

Starch Granules Swelled by Heating in Water in Presence of a Disintegration-Inhibitor—Carl C. Kesler, Cedar Rapids, Iowa, to Penick & Ford, Ltd., Inc. No. 2,124,372. July 19, 1938.

Wet Fruit Given Surface Drying So As to Avoid Carrying of Liquid to Dry End of Machine—Edwin M. Wayland, Covesville, Va. No. 2,124,381. July 19, 1938.

Confections Frozen on Sticks Mechanically Gripped, Dipped Into a Fixed Tank of Coating, and Raised for Draining and Solidification of Coating in a Continuous Manner—William J. Taylor to The Lamson Company, Syracuse, N. Y. No. 2,124,387. July 19, 1938.

Lettuce Wrapped in Flexible, Tough, Moisture-Permeable Material, Crated to Have Wrapped Product in Contact with Ice so That Water From Melting Ice Flows Over Wrapped Lettuce—Wesley Dodge, Oakland, Calif., one-half to Paterson Pacific Parchment Co. No. 2,124,412. July 19, 1938.

Rancidity in Oils and Fats Retarded by Addition of Small Quantity of Residue from Spice Oil Distillation—Donald J. Maveety, Millburn, N. J., to National Biscuit Co., New York, N. Y. No. 2,124,706. July 26, 1938.

Oil and Fat Deodorized Through the Action of Small Bubbles of a Gaseous Agent Distributed Through the Body of the Oil by a Rotatable Perforated Disk—Roy C. Newton and Walter F. Bollens, to Industrial Patents Corp., Chicago, Ill. No. 2,124,707. July 26, 1938.

Cup Pastry Molded and Baked in an Automatic Continuous Manner—James W. Wharmby, Dayton, Ohio, to National Biscuit Co., New York, N. Y. No. 2,124,723. July 26, 1938.

Rancidity in Fats and Oils Retarded by Addition of a Phenol—Paul L. Salzberg, to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,124,749. July 26, 1938.

Starch Separated From Corn in a Manner Which Permits Use of Centrifuge and Reuse of Recovered Process Water and Wash Water in Germ, Coarse Slop and Fine Slop Separations—Alfred H. Kelling, Oak Park, Ill., to International Patents Development Co., Wilmington, Del. No. 2,124,779. July 26, 1938.

Beverages Packaged in a Metal Container With a Petroleum Wax Continuous Coating as Liner—Alfred L. Kronquest, Syracuse, N. Y., to Continental Can Co. Inc., New York, N. Y. No. 2,124,832. July 26, 1938.

Pineapple Cut Into Relatively Thick Slabs and Subjected to Alternate Drying in Contact With Air and Pressing Between Hard Surfaces to Suitable Condition for Packing—Henri Daniel Rey, Papeete, Tahiti, to The Anglo California National Bank of San Francisco, San Francisco, Calif. No. 2,124,895. July 26, 1938.

Dried Prunes Flattened to Disk-Like Form Under Pressure With Flat Sides of Pits Lying in Plane of Disk and Then Soaked With Scalding Water to Regain Original Form—Henri Daniel Rey, Papeete, Tahiti, to Anglo California National Bank of San Francisco, San Francisco, Calif. No. 2,124,896. July 26, 1938.

Whole Fruits and Vegetables Divided Into Small Cubes by Mechanical Means—William E. Urschel and Joe Richard Urschel, Valparaiso, Ind. No. 2,124,935. July 26, 1938.

Sweet Potatoes Processed to Form a Converted Starch Adhesive—Howard S. Paine, Chevy Chase, Md., and Kyle Ward, Jr., Washington, D. C., to the People of the United States. No. 2,124,994. July 26, 1938.

Peanuts Freed From Foreign Substances in Vacuum Cleaning System—Hilbert E. Suggs, Dawson, Ga. No. 2,125,207. July 26, 1938.

Vitamin-Containing Fish Oil Hydrogenated to Give Product Having Melting Point Ranging From 30 to 45 Deg. C.—Alexander D. Barbour, to Ontario Research Foundation, Toronto, Ont. No. 2,125,215. July 26, 1938.

Lactic Acid Refined by Steam Distilling and Adding Small Amount of Hyrogen Peroxide to Condensate—Alexander Douglas Macallum, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,125,383. Aug. 2, 1938.

Salad Dressing Made to Have Butter-like Consistency at Cool Temperatures and Mayonnaise Consistency at Room Temperatures—Albert Musher, New York, N. Y., to Musher Corp., Elizabeth, N. J. No. 2,125,391. Aug. 2, 1938.

Milk or Milk Mixture Sterilized Through Addition of Hydrogen Peroxide and Potassium Iodide in the Ratio of 10 to 1—Joseph S. Reichert and Robert W. McAllister, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,125,398. Aug. 2, 1938.

Mayonnaise and Salad Dressing Ingredients Given Premixing Preliminary to Emulsification by Passing Through Aperture Between a Rotor and the Bottom of Premixing Chamber—William A. McLean, to Geneva Processes, Inc., Geneva, N. Y. No. 2,125,455. Aug. 2, 1938.

Bread Doughs in Loaf Lump Form Transferred From Divider and Rounder to Proofer in Pocket-Type Endless Conveyor—Sigmund Schiff, to J. H. Day Co., Cincinnati, Ohio. No. 2,125,654. Aug. 2, 1938.

Filled Confections Made by Mechanical Means—Frank P. Kretchmer, Chicago, Ill. No. 2,125,729. Aug. 2, 1938.

Liver Extract Prepared by Use of Water-Alcohol Solution, 60 to 80 Per Cent Alcohol by Volume, and Cooling to Not More Than 15 Deg. F.—Havard L. Keil, to Armour & Co., Chicago, Ill. No. 2,125,844. Aug. 2, 1938.

Anhydrous Shortening Made From Edible Fatty Material Containing Small Amount of Lecithin and Triethanolamine—Charles E. Morris, to Armour & Co., Chicago, Ill. No. 2,125,849. Aug. 2, 1938.

Sirup Made From Sweet Potato—Howard S. Paine, Chevy Chase and Elias Yanovsky, Washington, D. C., to the People of the United States. No. 2,126,133. Aug. 9, 1938.

Ground Meat Treated With 5 to 10 Oz. per 100 Lb. of Meat With Mixture Containing 45 to 49 Per Cent of Na_2CO_3, 45 to 49 Per Cent of Sugar, 2 to 10 Per Cent of Paprika—Charles F. Gallagher, Lansing, Mich. No. 2,126,187. Aug. 9, 1938.

Vegetable Oils Refined by Treatment With a Hydrated Amine—Siegfried Leonard Langedijk and Willem Coltof, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif. No. 2,126,334. Aug. 9, 1938.

Potatoes and Other Vegetables Sliced in Course of Movement Around Inner Wall of Drum Into Which a Slicing Knife Has Been Fitted—William E. Urschel and Joe Richard Urschel, Valparaiso, Ind. No. 2,126,361. Aug. 9, 1938.

Beverage Flavoring Syrup Made From Maté Leaves—David Edward Fink, Kansas City, Mo., No. 2, 126,374. Aug. 9, 1938.

Milk Filled Into a Small Necked Container—Leslie A. Mapes, Palisade, N. J. to Borden Co., New York, N. Y. No. 2,126,402. Aug. 9, 1938.

Mechanical Means for Combining Regulated Quantities of Food Material—Gordon C. Schaub, Bayonne, N. J. to Best Foods, Inc., New York, N. Y. No. 2,126,414. Aug. 9, 1938.

Fish Scrap Converted Into Concentrated Food Product Rich in Mineral Constituents Through Action of Acetic Acid, Filtering and Drying—Walter H. Boutilier, Halifax, Nova Scotia. No. 2,126,445. Aug. 9, 1938.

Grape Fruit Sterilized During Passage Through Coils Submerged in Water at Sterilizing Temperature—Lewis Emmettee Holloway, Leesburg, Fla. No. 2,126,552. Aug. 9, 1938.

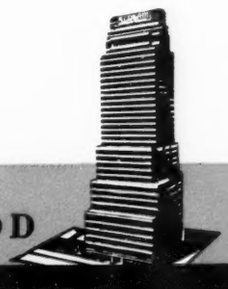
Corn Steep Water Concentrated in Multiple Effect Evaporating Unit—Rush O. McCoy, Berwyn, Ill. to International Patents Development Co., Wilmington, Del. No. 2,126,568. Aug. 9, 1938.

Heated Cheese Emulsified by Injection of Carbon Dioxide and Hydrogen—Edward Freidel, Syracuse, N. Y. to Kingan & Co., Inc., Indianapolis, Ind. No. 2,126,679. Aug. 9, 1938.

PUBLIC RELATIONS IN THE *Food Industries*

PUBLIC RELATIONS *for* INDUSTRY

A presentation of the imperative need of mutual understanding in the conduct of our daily work ...with special reference to the food industries.



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An Editorial Service to Meet

INDUSTRY'S MAJOR PROBLEM

To the Readers of
FOOD INDUSTRIES:

THERE IS NO DOUBT that today the American people are taking a keener, more critical interest in the conduct of business than ever before. And when I say critical, I mean exactly that. During recent years most of them have suffered loss, either of jobs or of savings, and under such circumstances men are prone to accept without serious question any scapegoat that appears plausible. In the confusion of fears and resentments, they seem to have concluded that short sighted and selfish business management is chiefly responsible for their misfortune.

However mistaken and unfair such conclusions may be, management cannot ignore them. It must recognize that in the long run, the opinions of men are the result of experience, of what happens to them each day, much more than of what they are told. Progressive management has already faced that fact; has already begun to think and work beyond the technicalities of production and distribution that once absorbed most of its energies. It sees more clearly and deals more proficiently with its human responsibilities. It is learning to reconcile the economic success of the industrial unit with the social welfare of worker and community.

Presently, every business—the small retailer as well as the large manufacturer—must learn how to interpret more convincingly to its own public the social as well as the economic benefits of its policies and accomplishments. Only as each business satisfies the newly aroused and critical interest of people in its affairs will it be able to disarm those who trade on the human tendency to blame our troubles on someone else. Yes, if business as a whole is to win a favorable public opinion, each and every business must act to improve its own public relations.

The readers of this journal, and of other business publications, compose, we believe, a group that can achieve for American business a sound and lasting solution of this vital problem. They alone are in position to shape the working conditions of 21 million employees. They alone can mold the attitude of those other millions who compose the various "publics" to which all business must be responsible.

Heretofore, the function of business papers has been to exchange successful experience; to dig up and disseminate practical facts for the use of their readers, serving primarily the technical and merchandising needs of business. But this matter of human relations has now become of equal importance, for good industrial and public relations, it has been found, reduces corporate losses, removes fear and suspicion, promotes operating efficiencies in both production and sales. A better knowledge of public relations technique is, therefore, quite properly essential for men in, or moving into, positions of greater executive responsibility.

So, beginning with this insert, each McGraw-Hill publication sets out to strengthen its editorial service in the important domain of Public Relations. I hope that the million readers of McGraw-Hill's business papers will get much real and practical help toward building better relationships between their own businesses and their employees, their customers, and the communities in which they must carry on.

James H. McGraw, Jr.

President,
McGraw-Hill Publishing Co., Inc.

Why a Public Relations *Program*

IN LESS THAN TWO GENERATIONS the United States has changed from an agricultural to an industrial nation. Living standards and efficiencies at once the despair and envy of other countries have been created. Foreign delegations still flock to our shores to study our methods so that they may use them as patterns for their own organizations. Yet here at home today these methods, and the systems responsible for them, are under increasing attack.

Since every person employed in productive enterprise is a part of American industry, these attacks imperil the livelihood of nearly forty million workers and their dependents. The newest addition to the payroll has as much—if not more—at stake as the veteran business executive. That also is true of particular industries which at present may not be under direct fire. All industry is so interrelated and interdependent that even the seemingly immune enterprise must suffer when the legitimate activities and the buying power of its customers, or the customers of its customers, are curtailed.

Ironically enough, public acquiescence in many of the current attacks is an indirect recognition of the satisfactory manner in which our industrial system normally functions. Reasonable opportunities for the employment of those ambitious to put their mental or physical talents to work, and continually rising standards of living have come to be widely accepted as a matter of course. Any unfavorable change in these conditions leaves the general public surprised, confused and resentful. Such reactions as these make it easy for pressure groups to unloose destructive propaganda which further heightens resentments and breeds new misconceptions.

These misconceptions take many forms shaped by the experience, the inexperience, or the special interests of the critics. To one, it appears that business can't manage itself and must be owned and managed by the Government. Another believes that employees are underpaid or that stockholders and executives are overpaid. To others, corporate surpluses are too high. Many have convinced themselves that power and machines have reduced employment opportunities; and that industry can raise wages and reduce prices while costs go up.

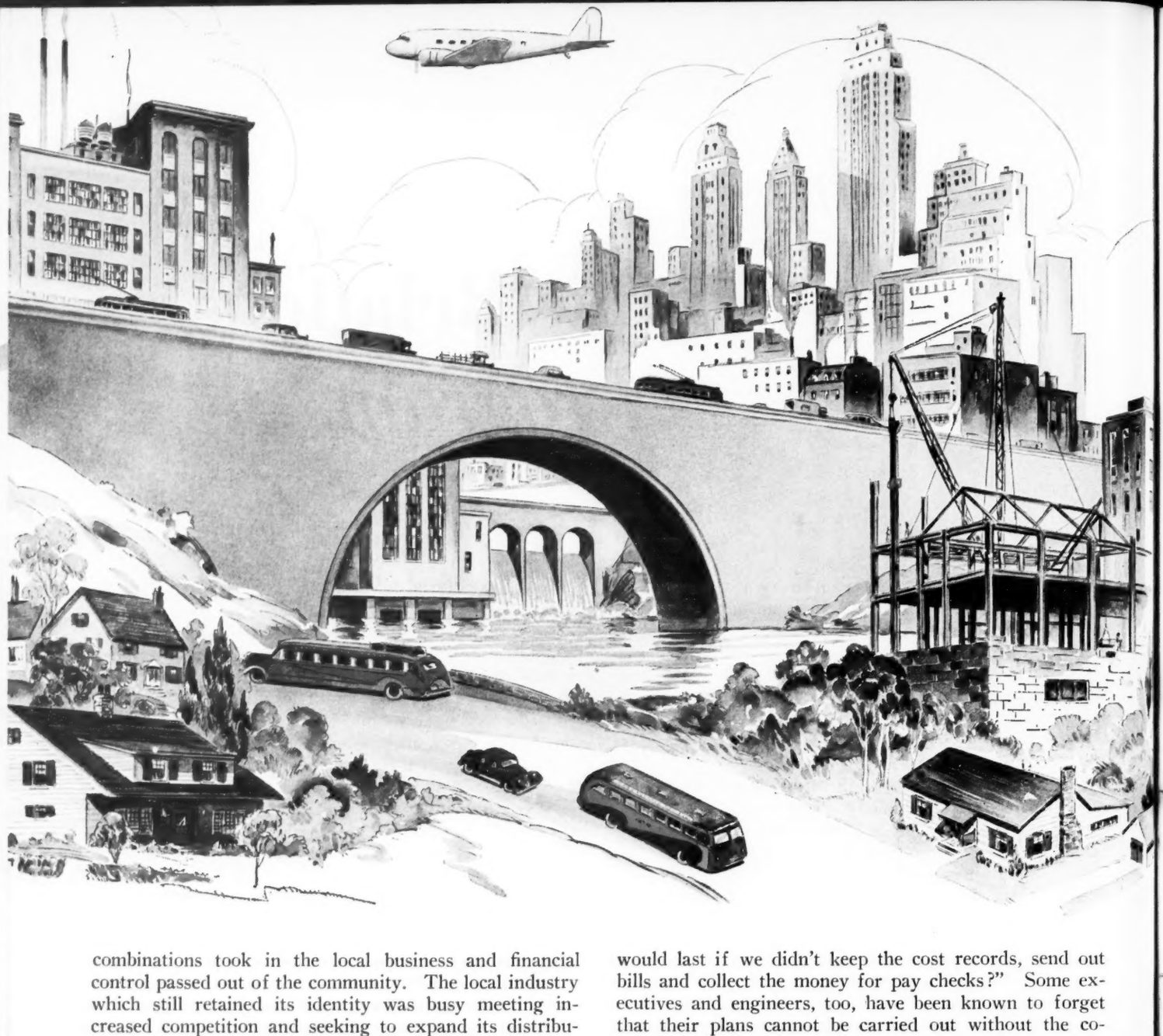
Several misconceptions are based on faulty generalizations. Because a few companies have been remarkably successful, it is argued that all could make money. Because some corporations have been ruthless, all corporations, it is contended, will stoop to unethical conduct to gain their ends. This is like saying: John Smith killed Bill Brown; John Smith is auburn-thatched; all redheads, therefore, are murderers. Unfortunately, those who would indict all business for the crimes of a few are more subtle in their approach and so create an impression not in accord with the facts.

To put it bluntly, American industry, once so highly praised for its contributions to the national well-being, is now on the spot. Prevailing misconceptions—of how business operates and what it does—have made a field day for those who propose to hamstring or destroy private initiative and individual opportunity. These proposals run a broad gamut: They include public ownership, increasing and rigid federal control at the expense of local autonomy, ill-conceived legislation on hours and wages, labor dictatorships, and confiscatory taxes on thrift and employment security.

While a man in the street may be criticized for his willingness to swallow these nostrums, he is not wholly to blame. Industry, too, has been at fault, in assuming either that he was fully informed on those phases of its operations which are properly a matter of public interest, or that a healthy curiosity should be discouraged. Misconceptions multiply where the facts are hidden.

THE TRAGEDY of the situation lies in the fact that it might easily have been avoided. In the simple days of local and localized industry, everybody connected with a particular enterprise knew everybody else connected with it, and the details of its operations were an open book. The boss and the employees were neighbors; the customers, for the most part, fellow townsmen. Outside purchases were limited largely to those products which the local community neither manufactured nor raised. Competition in the modern sense was practically nonexistent.

As industry developed and enlarged its field of operations, much of this early intimate personal touch was lost. The small enterprise grew bigger. In some cases



combinations took in the local business and financial control passed out of the community. The local industry which still retained its identity was busy meeting increased competition and seeking to expand its distribution. Little attention was paid to changing conditions that were fostering misconceptions about the personal relations of the business. Bit by bit the close acquaintance and familiarity of the early days disappeared.

Common understanding of these things also was impeded by the greater variety of occupations as industry expanded. Each man's job became so highly specialized that the old feeling of common partnership in a joint undertaking frequently was buried in an exaggerated feeling of the relative importance of his own work. This made it easy for each occupational group to get the idea that its contribution to the undertaking alone was essential and that many of the other groups were parasitic or, at best, unimportant.

Such mistaken beliefs are the exclusive property of no particular group. "Goods are valueless until sold," chants the sales staff; "without us the wheels of industry would cease to turn." The wheels would turn faster, growls the production department, "if we didn't have so many lame-brains drawing fat salaries as salesmen." Under the cold glance of both groups, the clerical force heatedly inquires: "How long do you think this business would last if we didn't keep the cost records, send out bills and collect the money for pay checks?" Some executives and engineers, too, have been known to forget that their plans cannot be carried out without the cooperation of other groups.

POSSIBLY the greatest single cause of misunderstanding and friction has been fuzzy thinking on social responsibilities. Many of the responsibilities which rested on the individual or the state in our fathers' and grandfathers' days have been shifted to the shoulders of industry. New ones constantly are added or proposed—often before industry has had time to adjust itself to those which have gone before. Some of these responsibilities affect employee relations; others involve customer relations. The worker, for example, no longer is completely defenseless against the occupational hazards of his employment. "Let the buyer beware" no longer is considered smart merchandising. Many of the changes now embodied in the laws were anticipated by industry itself. Opposition—valid or otherwise—to social legislation, however, has been used to damn business in the public eye.

Fortunately, the barriers to good will and common understanding can be broken down. The process is a simple one. It consists chiefly in maintaining good poli-

cies in human relationships and in keeping all interested people—employees, stockholders and their neighbors, customers and the general public—informed. It means telling them in plain terms what revenue is received and where it comes from, what revenue is paid out and who gets it, how an industry serves the individual, the community and other industries. Finally, it includes the acceptance of the social responsibilities which the advance of civilization imposes upon business.

Add all these things together and you have public relations.

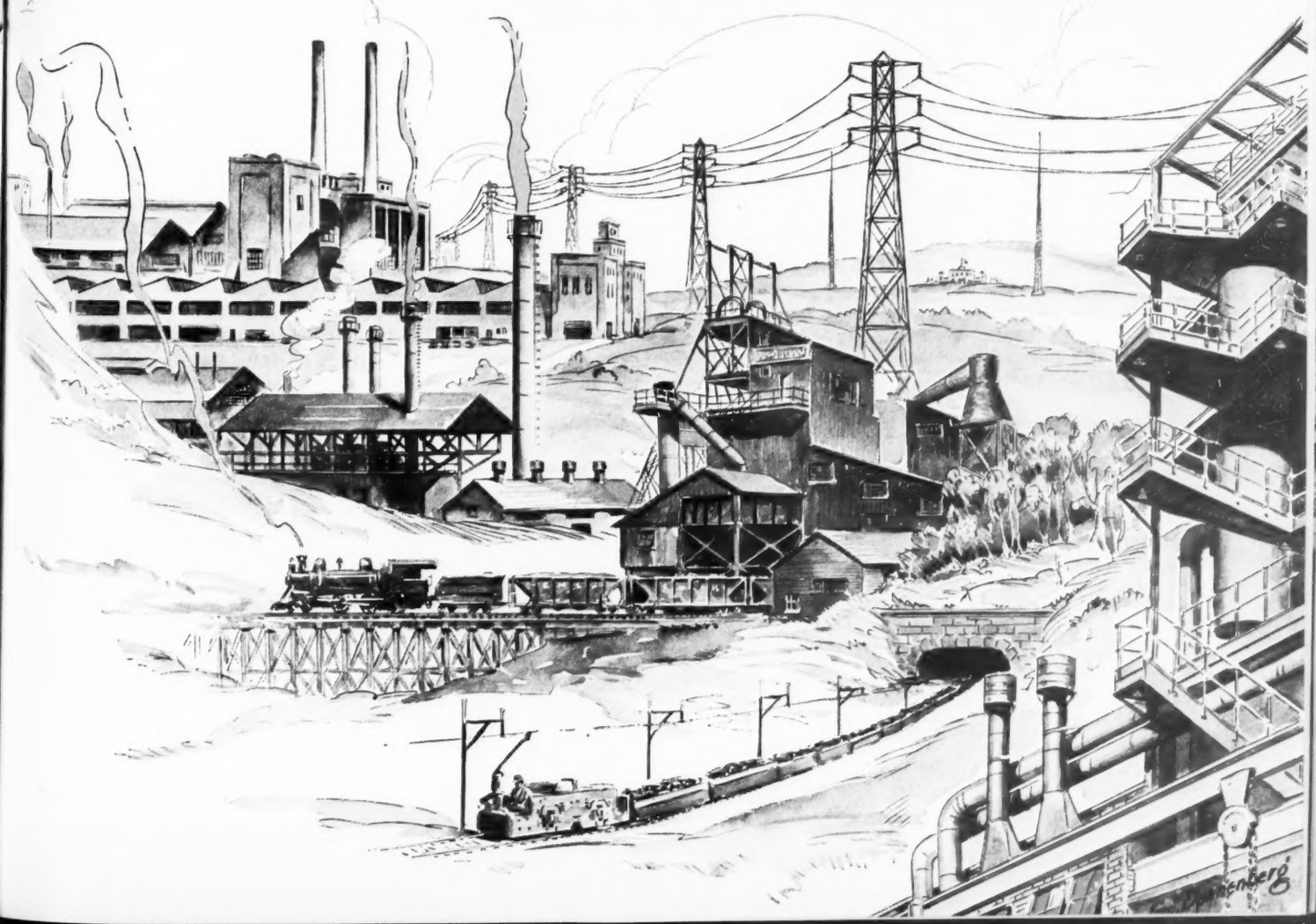
MOST EMPLOYERS are willing to accept their social responsibilities, but they are inexpert in making that acceptance articulate. Too many employers have failed to make clear their policies, their practices and their purposes as they relate to fair dealing with employees, investors and the general public. Their intentions have been good, but they have cloaked them with a veil of secrecy and made a mystery out of simplicity. As a result the uninformed have been given a royal opportunity to use their imaginations. And they have done it!

Public relations is a comparatively new activity for most business enterprises and involves a technic which too many have not yet learned. Obviously, the first place for each company to start is within its own organization. This is the "inside job" that builds a company's good name among its own family and lays the firm foundation for building public confidence and favor. As one exponent of the art phrases it: "Industry's public relations cannot be one thing and its private actions and policies something else. The two must be in complete accord."

The inside job should present no real difficulties to fair-minded employers. Most workers have a normal predisposition to view in a favorable light the organization in which they earn their livelihood. Most companies endeavor to conduct their operations so as to justify that favorable attitude. But too few of them are adept at dramatizing the facts that furnish a substantial basis for maintaining employee good will. So, where misunderstanding and suspicion born of ignorance exist, time may be required to break down the barriers that have grown up.

The task of telling this inside job to the outside world, however, will not be easy, for two reasons. First, it has been so long neglected that the backlog of misunderstanding is large. Second, public relations involves attitudes as well as actions, a viewpoint as well as an organization. Public relations is not a commodity that can be purchased like a car of coal or a bolt of silk; neither can it be sold by "canned" material. Each program to establish sound public relations must be individualized and indisputably stamped with the personality of the company promoting it. *And the deed must always back the word!*

But the task is worth the effort. For, with the inside job right, a properly conceived and intelligently executed public relations program offers business the means of successfully counteracting unjust public suspicion, unfair political attack and unwarranted outside dictation. The need is urgent.



How to Bring About GOOD PUBLIC RELATIONS

Ways to Find Out if Your Company Needs to Do Something About It

To be read mostly by top executives, i.e., Brass Hats

YOUR Public Relations is a short way of describing what people think about you as a businessman, or your particular business, or your employees, or your salesman, or your industry, or your product. People may think well of you, in which case you probably have good public relations. On the other hand, people may dislike you, in which case you have bad public relations. Or, as is more likely, people probably like you for some things you and your business do, and dislike you for some other things.

Who are all these people? They are everybody. "Everybody" includes your own employees, your neighbors and their employees; your competitors, and their employees; your fellow townsmen. "Everybody" also includes your customers and all their employees, and your customers' customers. And in the food business this takes in millions of people. "Everybody" takes in all the people who ever heard of you—in short, the public. What the public thinks and believes about your company is the state of your public relations.

How do you find out what the public thinks of your business or your industry? Sometimes it's easy. Your company may get some critical letters, or phone calls. People may come in and tell you some unpleasant opinions. Or they may tell them to your employees. If the information comes in this way, it may or may not come to the attention of the head of the company. A whole lot depends on what sort of a person he is and whether or not he cares a hoot what people think. If he does not care, the chances are that the business will get a very bad reputation with the public. But perhaps he does care; and in such a case your company is trying, very hard, to build up a good reputation with the public.

There are other ways to find out what the public thinks of your company. If you are a subordinate employee—a white collar worker—perhaps you won't hear much about it. But if you are an officer in the company, you will know all about it. That is one of the headaches of being a boss. There may be friction between the employees and the foremen. There may be strikes. And, except for sympathetic strikes, people don't strike against concerns that they like.

Then there are other ways of finding where you stand. It's a rare concern that never has a lawsuit. When the trial is by jury, in your own community, the jurors are usually your neighbors and fellow townsmen. If your company has excellent public relations, your chances of a favorable verdict (assuming the evidence warrants it) are pretty good. If, on the other hand, your company has poor public relations, the chances are that the jury will "sock" the corporation, quite unaware of the fact that they are unconsciously influenced by current beliefs.

Or, a still more effective way of measuring what the public thinks about your business is found when it is necessary to petition the city authorities to close a street at your plant, or grant a permit to extend a railroad siding or erect a big electric sign, or bridge across a street from one part of the plant to another. Where a company's relations with the public are good, the petition is often granted; but if they are unfavorable, the City Council or Board of Aldermen can find a dozen reasons why your petition should be denied.

That dead-end street or side street which your company may want to close will unexpectedly become a potentially important thoroughfare if the public opinion is not friendly. You may be astonished to find how many people would seem to believe that the town's growth would be seriously hampered by closing that particular street.

Of course, episodes like the foregoing don't come up very often in a company's life. When they do come up, they give a pretty good measure of public opinion—and also a good idea of the *value* of public esteem. But most concerns have to depend on less spectacular signs to find out how the wind blows.

Consumer complaints give you a good weather vane. Especially if the number is decreasing or growing in proportion to your total sales. And sales volume is also an index of what people think of your products and price and sales policies. To be sure, people do not buy your foods just to be a good fellow. But they may refuse to buy your products if they don't like your reputation or something you or your employees have done, quite apart from their opinion of the quality of your goods. Sometimes they may refuse to buy for reasons that may be either sensible or decidedly prejudiced and unfair. But

Facts that are not understood by the public are given in diagrams, charts, curves and data that appear in this discussion. Others are given at the end of the discussion, and many more are to be published in the months to come. If the food industries impress fact pictures such as these upon the minds of the public they will improve public relations by combatting ignorance and misinformation.

—THE EDITORS

WHERE THE FOOD DOLLAR GOES

7.92c	For primary materials, such as seeds, saplings, livestock, fertilizers, lumber, fuel, metals, etc.
47.20c	For the labor of farmers, factory workers, salesmen, clerks, rail workers, truck drivers and all others receiving wages, salaries, commissions or other compensation for taking part in providing food to the nation.
9.06c	For farm implements, processing equipment, trucks, buildings, and all other necessary machinery and supplies and their maintenance and repair.
4.40c	For rents of farms, factories, stores, offices and other facilities.
1.44c	For advertising and promotion.
2.32c	For wholesale and retail delivery service.
2.30c	For light, heat and power.
5.9 c	For interest and insurance.
5.68c	For direct Federal, State and local taxes.
1.1 c	For bad debts.
5.5 c	For miscellaneous expenses, including telephone, telegraph, mail, office supplies, etc.
7.18c	There remain as profit to all concerned.

TOTAL 100.00 cents in the $1

1.05c	Profit to the farmer.
.39c	Profit to railroads, truck lines and waterways.
.07c	Profit to brokers and agents.
2.71c	Profit to food manufacturers.
.49c	Profit to food wholesalers.
2.47c	Profit to food retailers.

FOOD CONSUMERS, and that means every person in the United States, trade their hard earned dollars for food in order to support life. Most consumers have only a few dollars with which to buy the food they need. So it is natural that they want to know what happens to those dollars—who the people are who share the dollars, how much each gets, and what they do to earn their share.

Looking at what the food dollar buys, we see that growing, transporting, processing and distributing foods are the steps that must be paid for. The food manufacturer carries out only one step. What his share is and what the rest of the dollar pays for are shown in the chart. It is based on facts given in "Who Gets Your Food Dollar," by Lazo and Bletz, published by Harper & Bros., New York, in 1938.

why they refuse is not the point. The real point is that some phase of your public relations may be unhealthy.

Contrary to a rather widespread belief, public relations deal with the public close to home more often than with the folks who are far, far away. And, of course, this means your own employees and associates. Sound public relations work begins largely with the humble, the homely and the commonplace things of life.

Take a look at your own plant when you come in tomorrow. Does it really look like a place to make things to eat? Do you have a parking lot for your own help? Or do they have to leave their cars on the street and thereby add to traffic problems? Is there a place for the visitor or business caller to leave his car? Imagine yourself as a salesman packing a heavy case of samples, catalogs and the like on a rainy day, a blistering hot day, or on a day when the ground is two feet deep with snow. Would you have to park your car about two blocks away? Perhaps you came in response to a call from your own purchasing department.

Does the plant look neat and trim at all times? Would you be glad to have your best customer come in unexpectedly? Would you be proud to show the place to that big prospect which your sales force has been trying to land for so long? Are all your employees neat and clean, or are there some you would never allow a visitor to see?

Suppose that the big customer or big prospect visits you, and you take him through the place. Suppose he gets "caught short" and asks to be directed to the men's washroom. Do you have a panic of fear lest he demand to walk into the nearest employee's washroom instead of waiting to get back to the private washroom for brass hats? If you have the customary panic, you can put it down

as one more "Indian Sign" that should tell you your company's public relations need dusting off and overhauling. Employees are as much your public as your best customers.

Here is another way to produce a bad public relation. Your own trucks, all gleaming and beautiful, with your company's name in big letters may be double parking and raising havoc with traffic while the driver makes a delivery. You and your driver are probably right: there was no other place to park the truck. But the fact remains that your own ad on your truck tells an impatient world just who is blocking the way.

Many concerns hire outside agencies to study the public's attitude. They get an impartial survey of opinion, for they know that sometimes your best friends won't tell you, and anyhow your own friends—especially those in the higher brackets—are not always reliable guides to public opinion.

You Take it for What Ails You

Now what would such a survey cover for a food manufacturer? Not political opinion, for business men don't spend their money that way. Rather it would cover plain ordinary everyday reactions of people, store clerks, shopkeepers, distributors and ordinary folks about the way your company handles them in their everyday contacts.

Or a survey is sometimes made for you by an outsider to find out what employees really think about you, not what brass hats think that they think.

Space will not permit a further discussion of how to find out what is wrong and needs correction. Sometime in the future other articles in Food Industries will develop the idea in more detail.

At this point it is important to explain that no company, however ably managed, is 100-per cent perfect on public relations. The best of them are constantly studying themselves in relation to the public with the idea of correcting any faults. From which you can correctly infer that public relations work is a sort of corrective medicine. You take it for what ails you. Hence a correct diagnosis is all-important.

Who Does The Public Relations Job?

Ask any businessman: "Who is in charge of your public relations work?" and in the majority of cases —if he goes in for any such activity at all—he will tell you that the office manager, the lawyer, the advertising manager, or the advertising agency or some public relations counsellor is in charge. Or perhaps he has some executive in the company who is responsible for it and has an appropriate title. Then ask him: "Who *does* the public relations work?" If he looks surprised, and says that it is all up to the man in charge of public relations, he is not aware of the fact that the job is everybody's job—everybody in the organization from the president down. It's an everyday job for everybody—just like good manners—or working for the company.

The man in charge of public relations is only a guide or a leader. No matter how good he is, the company must become imbued with the spirit of always doing the correct thing to cultivate a good feeling on the part of the public or else his services may be fine window dressing, but they don't fool anybody—nobody but the president and the board of directors. The executives of the company must be behind the program, 100 per cent. You can't delegate public relations any more than you can delegate worry or hire someone to worry for you.

Which brings up another point where a lot of concerns go haywire on public relations. They seem to think that publicity—getting their name into the newspapers about this and that—is good public relations. Maybe so, but more often it is the other way around.

Any good and experienced public relations man will tell you that often it is better public relations to keep the names out of the papers—not by withholding interesting and important facts, but by fair play and telling *all the facts*. This is done so that no reporter has any chance to draw on hearsay or his own imagination to fill up the gaps in the story he has to cover.

A certain man, who was once head of a big food company, had a violent hate of reporters. One of them came in one day and asked a perfectly legitimate question. The president's reply, though unbelievably bad, is quoted exactly as it was given. Said the president, "Mr. Newspaperman, the less I see of you and your kind, the better I will like you."

What was the result? Any time that company got into the news with accidents, fires, strikes, farmer troubles, price increases, or other matters that do not improve public relations, the news went on the front page! For years the press was hostile and played up all the bad news. Which is to say that their public relations were pretty sad.

Now the strange thing is that that particular company had been employing a good public relations man—probably one of the ten best such men in the entire food business. But the company executives, especially the president, seldom took his advice or followed his guidance. They seemed to think that the public relations man could do all that was necessary and that they could go ahead as they pleased in the same old way.

Another concern, in somewhat the same fix, once tried to make amends. The company created an occasion for a news event. They gave a big party. Invited the press. Poured cocktails and highballs for hours. Handed out a lot of "canned" publicity. But was there a single executive of the company on hand to greet the press? Not one! The board of directors and the brass hats had a separate party in another hotel. And once more a golden opportunity to cultivate a friendly press was lost.

Publicity in newspapers and magazines has a lot to do with public opinion. But to think the two are identical is to confuse the form with the substance. Publicity has a lot to do with molding public opinion. But it has to be based on sound fundamentals to be effective. The public and the press are quick to discover insincerity and camouflage. If the facts do not justify the statements, nobody gets fooled for any length of time.

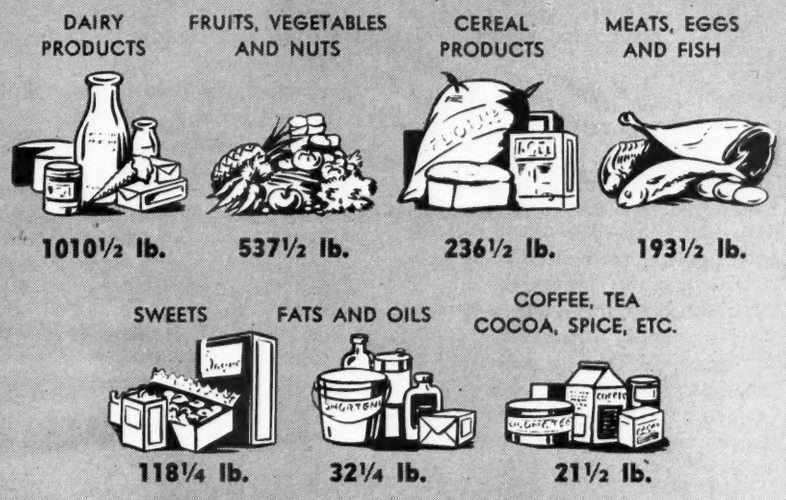
It is vital to remember that a tremendous amount of information circulates by word of mouth—never sees the printed page. And this word-of-mouth information has more to do with molding public opinion than all the tons of printed matter that can be put out. People will believe word-of-mouth stories where they would be skeptical of truth in a printed page. That's why public relations begins at home in your own plant with your own people. They know the facts—or think that they do—which is the same thing. And that is why publicity is only a small part of public relations work.

We live in an age of increasing skepticism. People are more and more inclined to doubt the sincerity or honesty of motives of those who are higher up. "Oh Yeah?" did not become a nation-wide popular expression of doubt except by virtue of the fact that everybody has become doubtful.

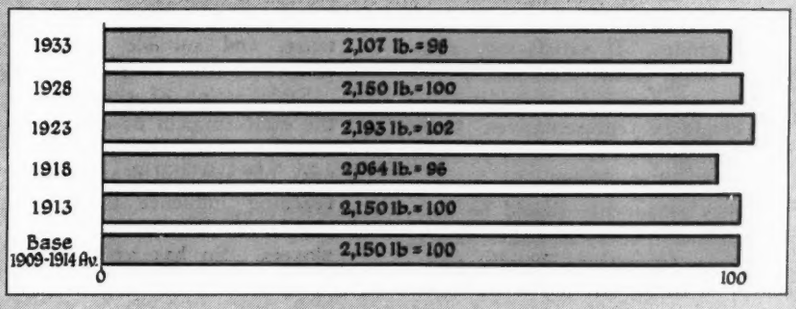
Lip service to public relations without good deeds merely adds to the disquiet. If good public relations are to be cultivated by some concerns, it is

The Job Done By The Food Industries

Each person in the United States, according to figures of the U. S. Department of Commerce, consumes on the average *2150* lb. of food every year. This is made up of:

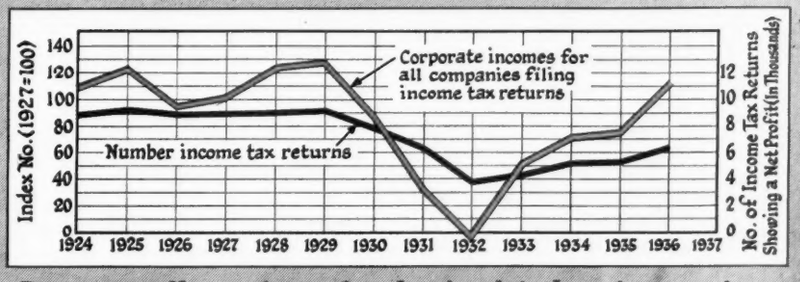


Variations in per capita food consumption.



The quantity of food that must be supplied by the food industries remains practically constant. Amounts used of certain foods may vary from year to year, but the total of all foods consumed does not vary much, except for the annual increase necessary to supply an increasing population.

In supplying its share of this demand for food, the food industries sometimes make a profit, sometimes suffer a loss, as is shown by this chart.



But, regardless of profit, the food industries continue to supply the nation with food.

going to require a mental upheaval in the minds of their managements—something like conversion to Christianity. It means a decided change of heart, a change of attitude—sometimes a change of management. And it must be permanent or else you may hear some disgusting guffaws from your own people.

Public relations begins at home, first, last and always. If every concern in every line of business in these United States had good public relations in its own plant and its own community, there would be no nation-wide problem of public relations for industry.

Public relations begins at home, and business must take the initiative. Each business must start it. If you wait for the other fellow to start it, you may find out that he has been waiting for you.

Two Aspects of the Job to be Done

When you decide to improve your public relations, it is well to keep in mind the various phases of the activity, so that each may be directed intelligently and effectively.

FIRST: *The Inside Job.* Your own problem of relations with your own employees.

If the inside job is not done right, if your public relations with those who know you best are not good, then there is no use trying to cultivate goodwill elsewhere. It's wasted effort.

SECOND: *The Outside Job.* This is the job of cultivating goodwill with those who are outside your business.

In the business of manufacturing foods this is a particularly important job. The relationship of the food manufacturer with the public is particularly intimate. The public eats your foods. No other industry comes closer to the public than that. For that reason, the food manufacturer has had much experience in cultivating the consumer. Yet this is a job that is never done. New consumers are born every day and they have to be educated later on. It is significant that the biggest and best known food companies are the ones who are doing the best and most carefully planned public relations jobs.

Good Leadership Essential

Before going into detail about the technique of public relations work, it is important that a proper leader be chosen. That is the No. 1 step. It

is no job for an amateur, or a weakling. He needs to be a man of successful experience, a good salesman and a good fighter. He needs these qualifications because his toughest job is to convince the people in his own company about what they should or should not do. And, of course, this necessitates putting him on a level with all other executives. He should be subordinate only to the president. In most large concerns where public relations are properly understood, he is a vice-president in charge of public relations or else he is assistant to the president. In small concerns he would be one of the executives who is engaged with this added responsibility.

In some other concerns, alas, he is way down the line where his authority is too limited for effective work. In such cases he is more likely to be only window dressing and the publicity man.

In very large concerns the Inside Job is done by one man who is usually called head of the department of industrial relations and reports directly to the president. At the same time the Outside Job is done by a vice-president who has no other duties but public relations. Both work very closely together, yet neither has anything to do with advertising or selling except that, as in any good outfit, the executives all consult each other to work toward a common good result.

Now for the Details

Inside Job of the Individual Company

STEP 1. *Set up a leader.* He must be an able executive, a man of business experience, and have skill in guiding human relations.

However, before doing that it is well to read the following:

"If the 'front office' or the president of a firm is not conversant with the laboring masses in his plant or the conditions there," says the head of a well-managed food company, "he should spend a week of his time doing nothing but walking around in his plant to find out for himself what they are doing, what they are thinking about, their troubles and their desires. He will learn many things worth while if he will only get his ear to the ground and be open minded, by listening to his lowest paid entered apprentice men.

"He could well spend some time sitting at the desk of his foremen, or his own picked men, to find out how they receive their subordinates, how they talk to them, and what complaints or constructive suggestions may be forthcoming from this investigation.

"Also the president could well spend time making a personal analysis of some of his key men—the active directors of the business, to find out their attitude toward employees, their viewpoint, and whether they themselves know the current underlying relationships between their men.

"After the president has made these three separate investigations, if he is still open minded and really interested in people, he will find out very definitely many things that will open his eyes. If on the other hand, he is just making a casual investigation to satisfy himself that he has the right system, and to vindicate his own work, he will not find the root of any trouble or the lack of proper relationships in his plant."

STEP 2. *Clarify Organization.* Uncertainty means uneasy feelings in the plant and office. It leads to company politics, which is still worse. The organization of the company should be clearly defined so that the authority and responsibility of individuals may be known to all. In large concerns this calls for more than a simple organization chart. A Manual of Organization may be necessary. Whatever is done should be adequate to define clearly the line of authority and the functions of all officials.

STEP 3. *Determine Personnel Policies.* A statement should be formulated by the top executives, and by representatives of all the management groups. If satisfactory relations have been established, the statement should be submitted to the employee representatives. Once adopted, the policies should be made known to all employees.

Policy statements should be definite in such matters as wages, hours, overtime, promotions, layoffs, vacations, sickness relief, safety, training and education, profit sharing, collective bargaining.

STEP 4. *Improve Personnel Efficiencies.* Make it possible for employees to be worth more to the company and, in consequence, to themselves. In other words, help them to progress. Strengthen those influences within the organization which increase the efficiency of the working force. The purpose is to advance the opportunity for the individual and the company through lower production costs, better service to customers, and improvement in the quality of the products.

This requires the establishment of certain basic policies relating to:

1. Payment of prevailing wage and salary scale.

2. Evaluation of jobs and setting up of uniform scales of pay for equal grades of work throughout the company.

3. Establishment of pay differentials, having due regard for responsibilities, requirements in skill, mentality, working conditions and physical application.

4. Application of practical financial incentives also, where possible.

5. Setting up of positive procedures by which all changes in rate of pay are fully explained to all the employees concerned.

In connection with the foregoing it is worth harkening to the words of the head of a very successful food company that has done a splendid public relations job.

"If the executive in charge of a business is too much interested in seeing that only his officers and lieutenants are being cared for with high salaries, and not interested in seeing that the masses are catered to in the same measure, he will find people in the upper brackets thoroughly in accord with all his policies and he may be fooled into thinking that he is doing a real job."

STEP 5. *Assure the Well-being of Employees.* Look after the physical and mental well-being of employees by providing safe and sanitary working conditions, and the plant services necessary for comfort. This means adequate ventilation, heating, cooling, lighting, the elimination of noise, and suitable provision for rest, meal times and recreation.

Stabilization of employment, and the establishment of organized protection against unemployment, sickness, old age and death have a far-reaching influence upon both the physical and mental welfare of employees. So has assistance to deserving individuals in their problems of saving and housing.

STEP 6. *Train and Educate.* For the purpose of advancing men and women in the organization and also as good citizens in the community, a suitable program should be developed. Here is a very important place for teaching your own employees the truth about the economics of their own business, and business economics in general; also the relation of taxes, processing taxes, wage rates to costs and selling problems, and similar important matters.

The foregoing six steps are designed to create and maintain on the part of the employees a feeling of confidence in the management of the company and their own future.

This is the most important part of the Inside Job of public relations. It

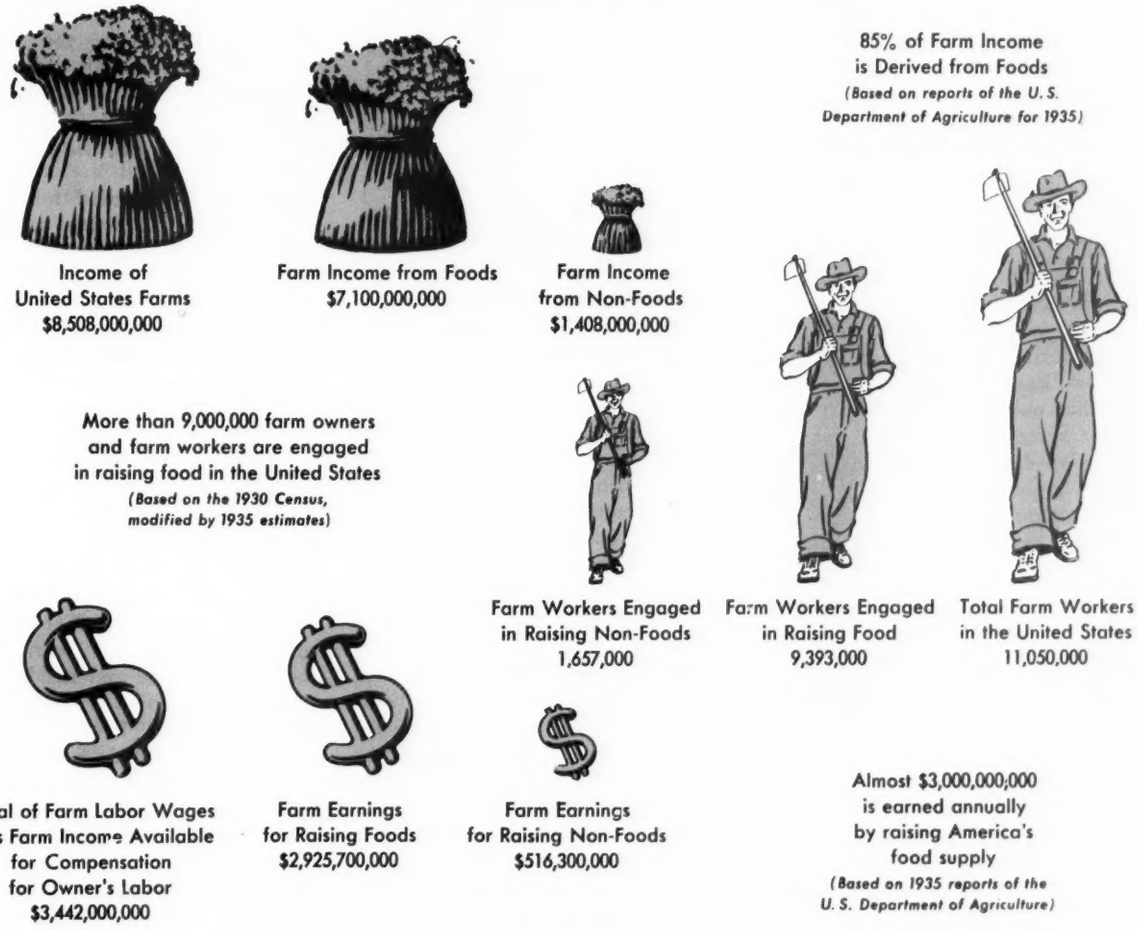
The Farmer's Best Market . . . The Food Industries

FOOD PRODUCTION is the main concern of the farm population of the United States. That is no news to anyone. But farmers produce many things other than foods, such as cotton, wool, tobacco, mules, hay, feed and pasturage, and other farm products that people cannot eat. The figures show that, in spite of the large amount of these nonfood crops, the business of raising food is by far the farmers' most important activity. In fact, 85 per cent of the farmers' gross income comes from food. Though 1935 was a drought year the farmer, his family and the hired help earned in wages, or the equivalent in food or shelter, the sum of $2,925,700,000 by producing the nation's necessary supplies of agricultural food raw materials.

Of all the people who work for a living in the United States, one-fifth of them work on farms. Their earnings, totaling nearly three billion dollars, were divided among 9,393,000 farm workers. This figures out $311.45 per person, which is little enough—less than a dollar a day. But this is farm wages—not total farm income.

Food production is the mainstay of agriculture. The food industries process and manufacture this food into forms which the consumer is willing to buy, and distribute it around the country to the places—mostly cities and towns—where the consumers live. The food industries are essential to agriculture. Without them the agricultural population would be helpless. Very few farmers could preserve their perishable foods for they do not have the equipment, and they could not distribute them except to nearby areas. They could not possibly reach the great urban and industrial markets where the majority of the food consumers live. Without the food industries the cities could not exist, and the farmers would be worse off.

City folks need the farmer, and the farmer needs the city folks. The food industries only bridge the gap between the two.


85% of Farm Income is Derived from Foods
(Based on reports of the U. S. Department of Agriculture for 1935)
Income of United States Farms $8,508,000,000
Farm Income from Foods $7,100,000,000
Farm Income from Non-Foods $1,408,000,000
More than 9,000,000 farm owners and farm workers are engaged in raising food in the United States
(Based on the 1930 Census, modified by 1935 estimates)
Farm Workers Engaged in Raising Non-Foods 1,657,000
Farm Workers Engaged in Raising Food 9,393,000
Total Farm Workers in the United States 11,050,000
Total of Farm Labor Wages Plus Farm Income Available for Compensation for Owner's Labor $3,442,000,000
Farm Earnings for Raising Foods $2,925,700,000
Farm Earnings for Raising Non-Foods $516,300,000
Almost $3,000,000,000 is earned annually by raising America's food supply
(Based on 1935 reports of the U. S. Department of Agriculture)

won't be done unless management has an ardent desire to have it done. Such things don't occur accidentally.

Not only is it necessary to *do* the inside job. It is equally essential to *let employees know* that it is being done.

The Outside Job Comes Next

When a company has done a good job on the inside (and not before), the most important step has already been taken toward building up goodwill outside the organization. With every forward step, the company is in a position to tell its customers and the public, not what it aspires or pretends to be, but what it actually is and how it contributes to public welfare. Moves like these are news.

For customers and prospects, as well as for the vast body of consumers,

there are many obvious facts about the food industry or a company in the food business that are of great interest. The food manufacturer is in an enviable position compared to the maker of equipment or the producer of raw materials that never go to the ultimate consumer without further processing. For the non-food manufacturers can only indirectly show how they aid the public in reaching a higher standard of living.

People want to know the facts about the companies which produce and manufacture their foods. They want to know the "how it is made" and the "why does it cost this much." They see a lot and hear a lot about "inefficiency of distribution." Farmers want to know why thy get only a fraction of what the consumer pays at retail. And everybody wants a rational explanation of why their food costs go down when times are bad and why they can't stay down at depression levels when business picks up.

Here is a vast area of public ignorance and misinformation. It is a challenge to the whole industry. Large companies can do and have done a lot for themselves in educating the public. In the trade associations, however, is where a great deal of the job of educating the public belongs. But it would be a great mistake to mix up an educational program designed to correct specific public relations problems with out-and-out sales promotion efforts such as "National —Week," or "Eat More—." Always remember that public relations activities are not a mere spring tonic for industry. You design a program to meet definite problems.

In the community where the company is located people judge the company by the things they are told (the word-of-mouth method). Sometimes they get their information from individuals or groups who are not parts of the organization and are working for selfish ends. These people may or may not give facts.

If the local public gets its information from employees, that fact gives to what they say a presumption of reliability and authenticity. Yet the employee can tell the truth only as he knows it. Hence, in promoting community goodwill, informed employees are an asset to the company that has done the Inside Job.

A company can participate actively in building goodwill by taking progressive steps to publicize facts about itself, making them available promptly, accurately, clearly and frankly, through the usual mediums of publicity that exist in every community.

A related method is that of taking an active and constructive part in community affairs. By itself becoming a good citizen and neighbor, a company makes itself known and liked. Here are types of community activities that have been used successfully. Some like the first have been used for years by certain branches of the food industry.

1. Holding "open house" in the plant for visitation by people of the community. Many food companies have open house all the time.
2. Close acquaintance and cooperation with the local press, always following the policy of giving the whole truth and nothing but the truth.
3. Taking part in exhibits or expositions of the products of local industries.
4. Joining with other industrial companies in the community to disseminate facts (like the charts and graphs given here) and to create and maintain public goodwill.
5. Encouraging employees to participate in civic affairs.
6. Discussing company and community affairs with local leaders of thought, such as clergymen and teachers.
7. Participating in the operation of a community foremen's club.
8. Circulating factory house organs to interested people *outside* the organization.
9. Presenting facts like the charts and graphs on these pages before civic organizations, women's clubs, parent-teacher groups, luncheon clubs.
10. Showing plant operations by motion pictures in schools and before other groups.

The Company's Cooperation With Its Industry

As a rule, an industry is represented as a whole by its trade association. As their representative, a trade association should be able to act as a clearing house for the exchange of plans and experiences of individual companies in the work of industrial and public relations. A part of the clearing house job can be the collection of industry-wide statistics, even national statistics about industry, and their presentation to member companies, ready for use.

The most benefit to the individual company is likely to come if it contributes willingly and fully to these activities of the trade association, for the effectiveness of such statistical studies will depend upon their completeness.

The Public Relations Job of the Community

In adition to all the previous suggestions there still remains the public relations job of the group of industries in a community which, carried out jointly by representatives of the individual plants, may promote local goodwill. Obviously this group can be effective only as it presents facts about the community's industries. An activity of this sort will have no standing before the press and public unless the organized industries of the community will set and enforce standards of membership, and without them such activities may result in unfavorable rather than favorable regard by the people of the community.

Once this cooperative working group is under way, it has unlimited possibilities for participation in local affairs. One of the most effective weapons in advertising is the local press. It has the opportunity to show that the welfare of the community as a whole and of all the individuals who live there are bound up together.

The Follow Up

Years will be needed for any company to put into effect all the suggestions given in the preceding pages unless that concern has already been consciously trying to cultivate good public relations. Some industries, far removed from contact with the ultimate consumer, will have a bigger task than the food industries. But even the group which has daily contact with the public, such as the dairy industry, has a problem; for milk prices have become a political issue in some regions. Daily contact with the public does not lessen the problem—it merely increases its importance.

More discussion of special aspects of Public Relations work, covering both the Outside and Inside Jobs, will appear in Food Industries in the ensuing months. From time to time, more dramatized data in the form of charts, graphs, diagrams as well as the actual figures will be presented. These will be for the purpose of giving you authentic material that you can use in doing the Outside Job. Save them and use them to correct any public misinformation about your business, the food business and industry in general.

If you have specific problems that need special studies, charts or data, the editors of Food Industries will be glad to learn your needs and will try to supply your wants.

Public relations is industry's No. 1 job. We are all in it from now on.

World Trade Makes Food Prices

Variations in Volume of Exports and Imports, Caused by World Economic Conditions, Affect United States Domestic Food Prices More Than Price Policies of Food Manufacturers

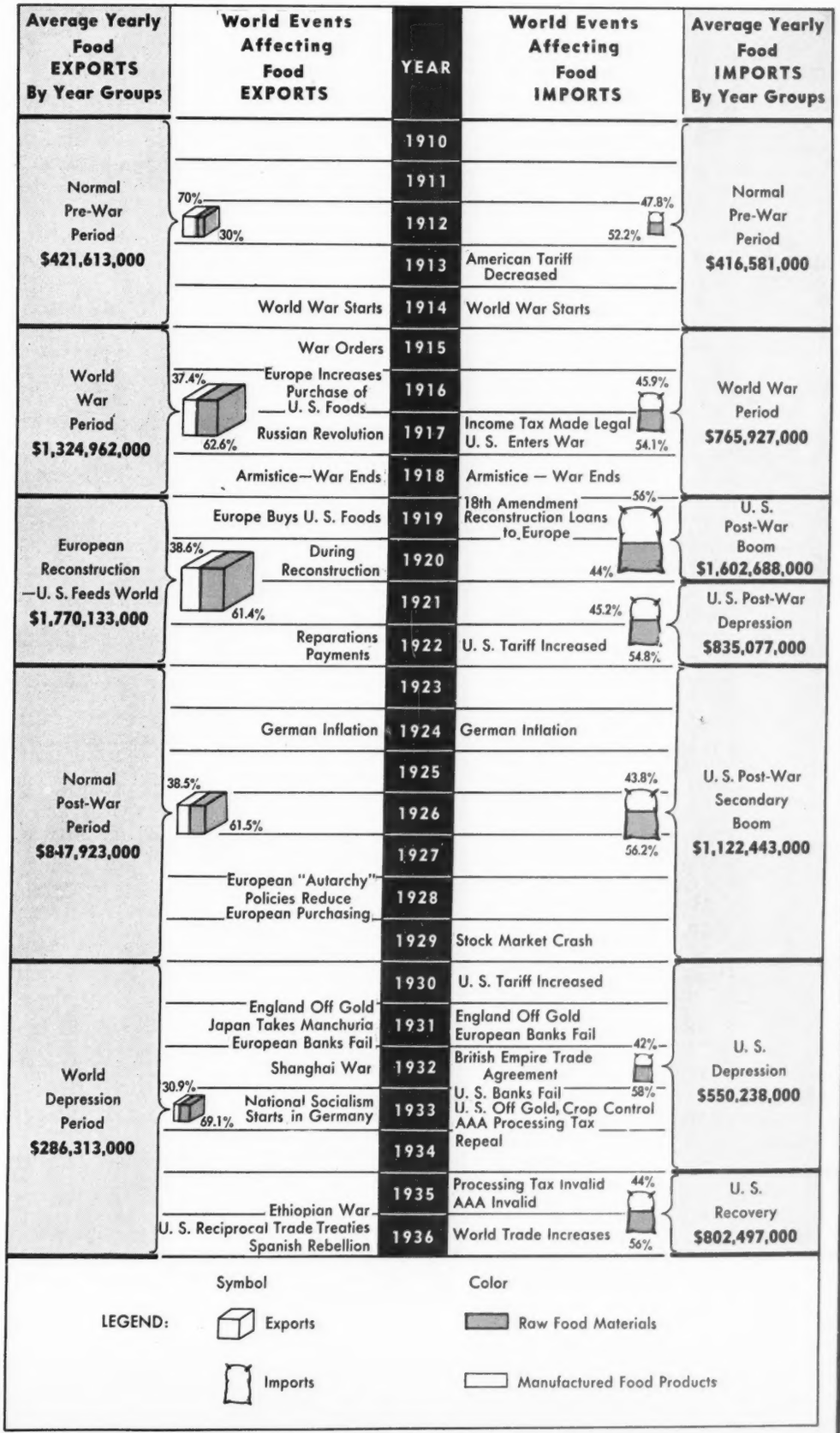
FOOD PRODUCTS differ from many other necessities of life because there are so many substitutes. You don't have to eat any one food, or any two or three foods, if you don't want to. If the price of anything is too high you can buy something else that is cheaper and be just as healthy. When meat is high in price, you can eat fish or eggs. If butter is scarce, vegetable fats may be used. Sugar and cereal products compete to supply your energy foods.

It seldom happens that all the foods in any one of these groups are scarce at the same time in the world market. If drought in the temperate zone reduces the world supply of wheat, sugar from the tropics is likely to be abundant. When meat supplies are low, fish supplies may be ample.

Even with a single commodity, it seldom happens that supplies in all producing countries are affected in the same way. Thus, when butter was scarce in the United States because of the recent droughts, supplies in New Zealand and in Northern Europe were above normal. Hence, in spite of the tariff, foreign butter came into the United States in large quantities and held the domestic price level down.

In addition to these effects of world supply of foods on United States food prices, world events have an influence on the supply and demand of foods and this is reflected in domestic food prices. For example, during the past twenty years, European nations have struggled to achieve "autarchy," that is, to make themselves independent of imports. To raise food prices in these countries, so that farmers would be encouraged to increase output, imports of United States foods have been restricted. This has cut down the export market for American raw and manufactured foods, and thrown a larger part of the total onto the domestic market, depressing the domestic price.

Influences like these are more important in setting the price of foods in the United States than are the price policies of American food manufacturers.



What The Food Industries Mean To Labor

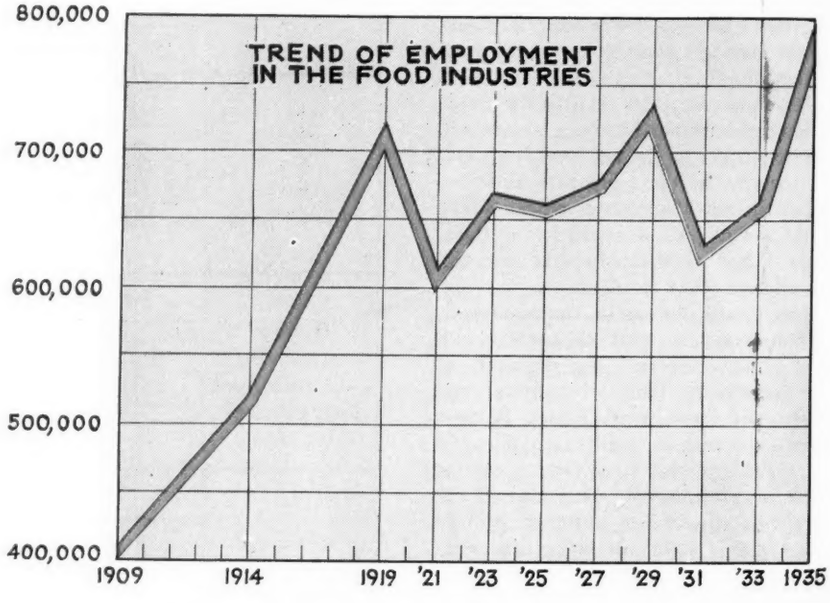
WAGE EARNERS in the food industries stand on the same economic level with their fellow workers in other manufacturing industries. In 1935, according to the U.S. Census of Manufactures, the food industries employed just over 10 per cent of all workers in the manufacturing field. For their work, these workers received just over 10 per cent of the total wage payments made by all manufacturing industry.

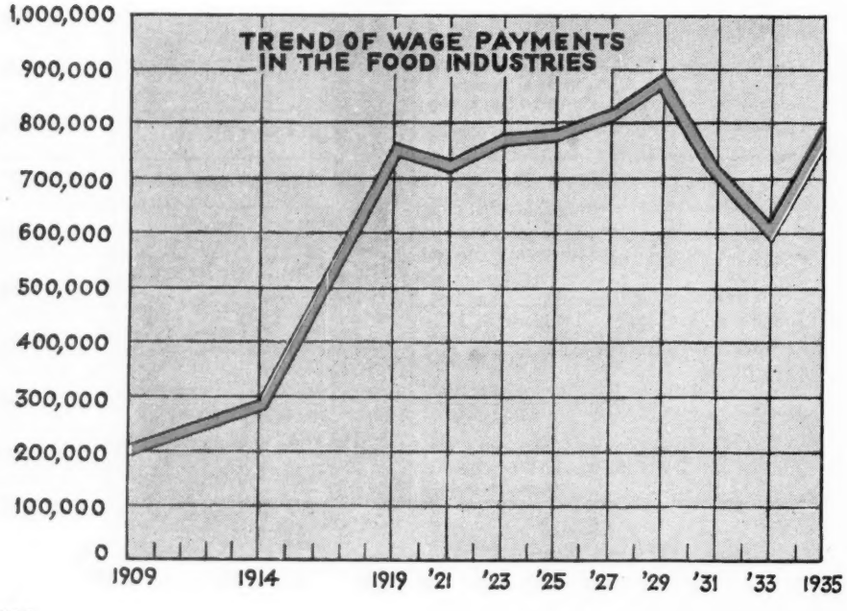
Food manufacturing industries according to the same census, employed 805,084 workers. This number is for the group called "Food and Kindred Products," with workers in the baking powder, yeast and salt industries added. The same group of food industries paid $809,043,120 in wages to their employees in that year.

Over a period of years, both employment and wage payments in the food industries have tended to rise. Reference to the charts on this page will show this general trend. From these charts it is also evident that a peak in employment and wages came during the World War. Following this, the trend resumed its normal course until 1929. Then the depression brought a new drop for the years 1931-1933. This was followed by an upward trend again in 1935 when, recovery having commenced, employment reached an all time high in food manufacturing.

Another point to note in the trend of wage payments in the food industries is the increase in wages per worker. In 1909 each worker received an average of $507. By 1935, the last year for which complete figures are available, he received an average of $1003. In 1914, each worker received an average of $566.

Along with this increase in wages received, the food industry worker is now able to buy more for his money. This is because his wages have increased more rapidly than the cost of the things that he buys. In 1914, the index of cost of goods purchased by wage earners, including food, clothing, rent, fuel, light, furnishings, and miscellaneous items, stood at 58.5 (1923–1925 average equals 100). In 1935 this index averaged 80.5. Hence, the cost of goods purchased by the worker increased 38 per cent, while wages increased 77 per cent in the same period.

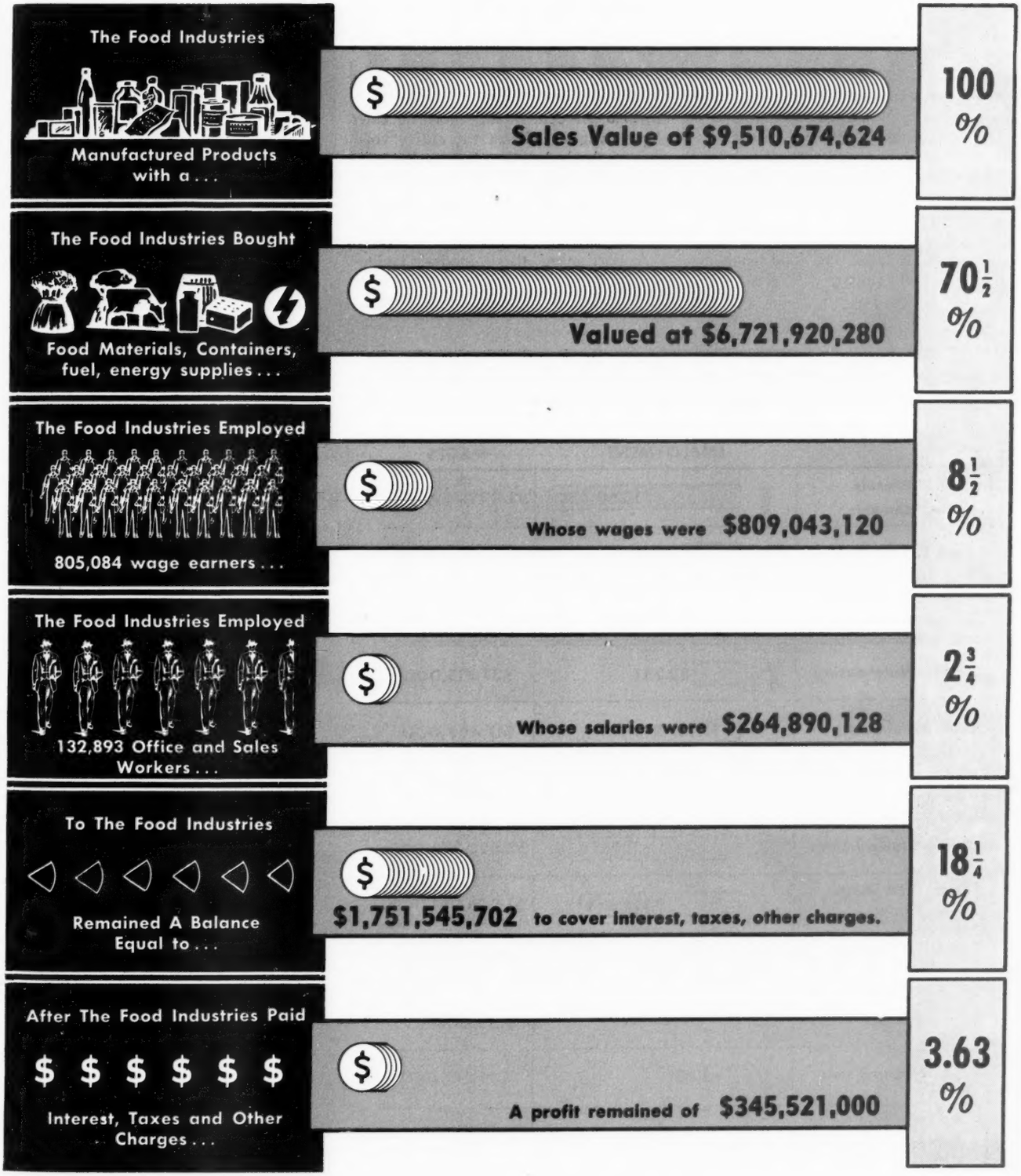




How The Sales Value of Food Industries Products Is Divided

A Profit and Loss Statement

(Based on 1935 U. S. Census of Manufacturers)


The Food Industries
Manufactured Products with a . . .
Sales Value of $9,510,674,624
100 %
The Food Industries Bought
Food Materials, Containers, fuel, energy supplies . . .
Valued at $6,721,920,280
70½ %
The Food Industries Employed
805,084 wage earners . . .
Whose wages were $809,043,120
8½ %
The Food Industries Employed
132,893 Office and Sales Workers . . .
Whose salaries were $264,890,128
2¾ %
To The Food Industries
Remained A Balance Equal to . . .
$1,751,545,702 to cover interest, taxes, other charges.
18¼ %
After The Food Industries Paid
$ $ $ $ $ $
Interest, Taxes and Other Charges . . .
A profit remained of $345,521,000
3.63 %

Distribution and Service Workers *Depend on Food Sales for Their Living*

WHOLESALE AND RETAIL SALE of foods, food warehousing, and the sale of prepared meals in hotels and restaurants account for a large share of the employment and payrolls which exist in the distribution and service industries.

Food is responsible for one-fourth of all wholesale sales. The food wholesalers, however, employ 31.5 per cent of all wholesale employees and pay out 27.3 per cent of all wholesale employee wages. Almost the entire volume of foods handled by wholesalers passes first through the plants of the food industries, where it is assembled, processed and packaged for the market.

A portion of these foods, moving from producer to market, is held in public storage warehouses, where it accounts for 53.3 per cent of the employment and 46.4 per cent of the wages.

Not all foods that are produced reach the ultimate user through retail food stores. More than one and one-half million people, including the personnel of the army, navy, marines, coast guard and CCC, and the inmates of hospitals, homes, institutions and prisons are consumers of foods. But little of what they eat passes through retail stores. The number of the employees operating the kitchens and dining rooms of these service institutions are not recorded, nor are there records of the amount of wages that they earn.

Much food is also sold by department stores, general merchandise stores and variety stores, and by fountains in drug and tobacco stores. How much of the labor and wages of the employees of these stores is chargeable against food sales is, however, not recorded.

The retail food stores alone, including chains and prepared food retailers such as restaurants and lunch rooms, account for 29.3 per cent of all retail employees and pay 28.9 per cent of all retail service wages. Retail food sales are 32.4 per cent of all retail sales, not including food sales made by department stores, general merchandise stores, variety stores, drug stores and tobacco stores.

Another group of wage earners who depend on food for their livelihood are those employed in the restaurant departments of hotels. This activity occupies 23.1 per cent of all hotel employees and they receive 21.7 per cent of hotel payrolls.

Summing up, these service and distribution industries employ more than one and one-half million people in the sale, distribution, preparation and serving of foods. For their work, these people are paid more than a billion seven hundred million dollars annually.

Employment and Wages paid by all Distribution and Service Industries and by those engaged in Distributing and Serving Food

	EMPLOYMENT	WAGES
All Wholesale Establishments	1,260,553	$2,022,262,000
Food Wholesalers	392,204	$547,346,000
Per cent accounted for by Food Wholesalers	31.1%	27.3%
All Public Warehousing	32,785	$37,715,000
Food Warehousing	17,373	$17,497,000
Per cent accounted for by Food Warehousing	53.3%	46.4%
All Retail Establishments	3,961,478	$3,623,289,000
Retail Food Stores and Outlets	1,158,823	$1,046,914,000
Per cent of Retail accounted for by Food Establishments	29.3%	28.9%
All Hotels	276,006	$183,008,800
Restaurants in Hotels	63,831	$39,741,000
Per cent accounted for by food departments of Hotels	23.1%	21.7%